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SECTION IV

(3rd EDITION)

Temperature & Humidity Measurement

CONTAINING

CHEMICAL AND INDUSTRIAL THERMOMETERS
THERMOGRAPHS AND HYGROMETERS, Etc.

BAIRD & TATLOCK (LONDON) LTD.

Office and Warehouse:
14-17 CROSS STREET, HATTON GARDEN, LONDON, E.C.1

Instrument Works:
HIGHAM LODGE, BLACKHORSE LANE, WALTHAMSTOW

EASTERN BRANCH (Office, Warehouse, Showroom and Repair Shop)
Avenue House, Chowringhee Square, CALCUTTA, INDIA

NEW ZEALAND: A. C. EVANS,
P.O. Box 240, PALMERSTON NORTH

CANADA: WILSON SCIENTIFIC INSTRUMENT CO.,
59 Wellington Street, West, TORONTO, 2

EGYPT: A. REID & SON (EGYPT),
50 Avenue Mosque, Heliopolis, CAIRO

SOUTH AFRICA: MITCHELL COTTS & CO. (S.A.) LTD.,
CAPE TOWN

For Other Agencies see Preface to Catalogue.

Telegrams:
"BURETTE, SMITH, LONDON."

Cables:
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ABC Code, 5th Edition, and others.

Telephones:
HOLBORN 2613 (4 Lines)
" 4525

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IN compiling this New Edition of our Standard Catalogue in Sectional Form, our aim has been to make it as convenient as possible for our clients to find any article they want, in the minimum space of time. Below will be found an outline of the Contents of each Section:—

SECTION I.—Typical examples of Benches, Fume Cupboards, Taps and Sinks, and is meant as a guide to clients when designing their laboratories.

SECTION II.—Apparatus required for the permanent equipment of a laboratory such as Balances, Furnaces, Ovens, Pumps and Stills alphabetically arranged.

SECTION III.—Ordinary apparatus required for laboratory use, such as Glassware, Porcelain Ware, Filter Paper and Graduated Ware, etc. These are also arranged alphabetically.

SECTIONS IV and V.—Thermometers and Pyrometers and heat-recording apparatus for all purposes.

SECTION VI.—Special apparatus scientifically grouped and arranged for all branches of Physico-Chemical Work.

SECTION VII.—Refractometers, Spectroscopes and Polariscopes.

SECTION VIII to SECTION XIV.—Specialised apparatus of all descriptions such as is required for Scientific and Industrial Research Laboratories as detailed in the Section Summary.

SECTION XV.—Apparatus for all the branches of Meteorology, etc.

SECTION XX.—Models for Anatomical work; a fuller and complete catalogue is sent on application.

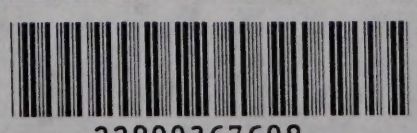
SECTION XXI.—Apparatus for Botany and Entomology.

SECTION XXII.—A full range of British and Foreign Microscopes, Epidiascopes, Episcopes, and Cameras for scientific purposes.

SECTION XXIII to SECTION XXVI.—Special apparatus for Bacteriology, Histology, Microscopy, Pathology and Biochemistry such as Microscope Slides, Cover Glasses, Microtomes, Incubators, Autoclaves, Embedding and Wassermann Baths, etc.

SECTION XXVII to SECTION XXVIII.—Special apparatus for Physiology, Pharmacology and Psychology.

Lists of Technical books and Index complete the whole range of Apparatus ndard Catalogue Vol. I, II, III. Vol. IV is still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SECTION IV.

The Measurement of Temperature and Humidity.

1. MERCURY IN GLASS THERMOMETERS.

CHEMICAL - - Ordinary.
Standard.
Sheathed.
Insulated, paper scale.
,, glass ,,
To I.P.T. and S.T.P.T.C. specifications (See Section XII, Oil.)

MISCELLANEOUS - Boxwood, wall types.
Porcelain, room ,,
Clinical.
Veterinary.
Dairy. (See also Section XXVI.)
Bath.
Pocket.
Oven.
Incubator.

INDUSTRIAL - - Ordinary, glass.
Sheathed.
Dial.
Maximum and Minimum.
Surface, mercury in glass.
Surface, electrical resistance. (See Section V, Pyrometers.)

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2. MERCURY IN STEEL THERMOMETERS.

Indicating, various types.

3. THERMOGRAPHS OR RECORDING THERMOMETERS.

Bimetallic.
Mercury in Steel,
,, ,, Recording and Indicating.
,, ,, Recording with Time Record.

For Electrical Resistance and Thermo-couple Thermometers see Section V, Pyrometers.
For Meteorological Standard, Special Sensitive Thermographs, and Solar Thermometers; Mercury in Steel types for Deep Sea and Agriculture, etc., see Section XV, Meteorology.

4. HYGROMETERS.

Wet and Dry Bulb Thermometers.
Spring.
Hair.

5. HYGROGRAPHS OR RECORDING HYGROMETERS.

Hair.
Bimetallic (Wet and Dry Bulb).
Mercury in Steel (Wet and Dry Bulb).
Electrical Resistance.

6. THERMO-HYGROGRAPHS FOR RECORDING BOTH TEMPERATURE AND HUMIDITY.

For Precision Hygrometers, Sensitive Thermo-hygrographs, etc., see Section XV, Meteorology.

7. TEMPERATURE CONTROLLERS, AUTOMATIC.

Mercury in Steel and Compressed Air Pattern.

For Electrical Patterns see Section V, Pyrometers.

PURE CHEMICALS · MICROSCOPIC STAINS · SOLUTIONS

[1933?]

Mercury Thermometers.

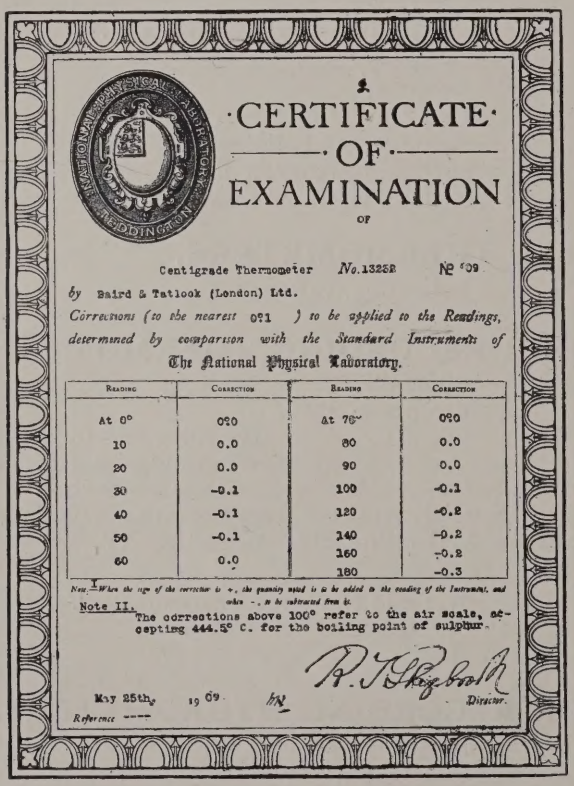
THERMOMETERS OF FINEST ENGLISH MANUFACTURE.

To reduce Centigrade degrees to Fahrenheit, multiply by 9, divide by 5, and add 32. Example: (20° C. × 9 ÷ 5) + 32 = 68° F.

To reduce Fahrenheit degrees to Centigrade, subtract 32, multiply by 5, and divide by 9. Example: (104° F. − 32) × 5 ÷ 9 = 40° C.

Thermometrical Equivalents.

Fahr.		Cent.	Fahr.		Cent.
600°	=	315·55°	180°	=	82·22°
500°	=	260°	150°	=	65·55°
400°	=	204·44°	100°	=	37·77°
300°	=	149°	60°	=	15·55°
266°	=	130°	32°	=	0°
212°	=	100°	0°	=	−17·77°



·CERTIFICATE·
·OF·
EXAMINATION
OF

Centigrade Thermometer No. 13228 № 09
by Baird & Tatlock (London) Ltd.
Corrections (to the nearest 0°1 *) to be applied to the Readings, determined by comparison with the Standard Instruments of*
The National Physical Laboratory.

Reading	Correction	Reading	Correction
At 0°	0°0	At 76°	0°0
10	0.0	80	0.0
20	0.0	90	0.0
30	-0.1	100	-0.1
40	-0.1	120	-0.2
50	-0.1	140	-0.2
60	0.0	160	-0.2
		180	-0.3

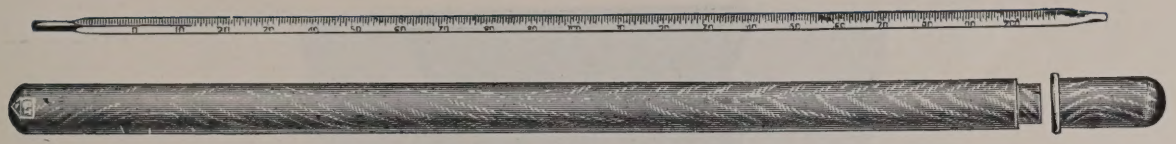
Note I.—When the sign of the correction is +, the quantity stated is to be added to the reading of the instrument, and when −, is to be subtracted from it.

Note II.—The corrections above 100° refer to the air scale, accepting 444.5° C. for the boiling point of sulphur.

May 25th, 1909 Director.
Reference ----

We give on pages following a selection of thermometers in several grades. They are of first-class make and carefully calibrated. The tubes only are kept in stock ready for graduating as required. **Time required for delivery of standard thermometers with National Physical Laboratory Certificates, four to five weeks, according to the time taken in standardising.** We are prepared to make any thermometer to specification, and the list is intended as a guide to selection only and not as a complete range of our manufactures.

N.B.—The National Physical Laboratory tests all thermometers by immersion up to within a negligible distance of the end of the mercury column.



TH2-TH10

TH2 Thermometers, Standard "A," finest quality, graduated with the utmost precision, very fine dividing lines for the most accurate observations. These thermometers all have the essential points 0° and 100° Cent. marked on the stem, and can be compared and standardised by calibration and comparison at the freezing and boiling points of water without the aid of other thermometers. **Made of specially selected glass.**

No. 1. −5° to 105° C., in tenths of degree; length, 21 in.		*d*	£2	17 0
N.P.L. Certificate for No. 1—				
At every 10 degrees to the nearest 0·05 degree	extra	*n*	£0	19 3
At every 5 degrees to 0·02 degree	,,	*n*	£3	1 6
Morocco case for No. 1	,,	*n*	£0	9 6
No. 2. −5° to 55° C., in tenths of degree, with graduations at top 99° to 101° C.; length, 18 in.	each	*d*	£2	11 0
No. 3. +50° to 105° C., in tenths of degree, with graduations at bottom −1° to +1° C.; length, 18 in.	each	*d*	£2	11 0
N.P.L. Certificate for Nos. 2 and 3—				
At every 5 degrees to the nearest 0·05 degree	extra	*n*	£1	0 6
At every 5 degrees to the nearest 0·02 degree	,,	*n*	£1	18 6
Morocco case for Nos. 2 and 3 together	,,	*n*	£0	10 6

TH4 Thermometers, Standard "A," same class as TH2. Set of ten 18 in. thermometers as used at the N.P.L., 0°–10°, 10°–20°, 20°–30°, 30°–40°, 40°–50°, 50°–60°, 60°–70°, 70°–80°, 80°–90°, 90°–100° C., divided into fiftieths of a degree. Nos. 2–10 provided with zero point graduations for checking purposes. In a case .... per set *d* £25 0 0

National Physical Laboratory Certificates for above, tested at every 2° to nearest ·005°	extra per set	*n*	£14	14 0
Any of the above thermometers supplied separately in a wood case	each	*d*	£2	10 6
National Physical Laboratory Certificates, tested at every 2° to nearest ·005°	extra each	*n*	£1	10 0

TH6 Thermometers, Standard "A," same class as TH2. Set of four 18 in. thermometers similar to above, but with 25° on each, viz. 0°–25°, 25°–50°, 50°–75°, 75°–100° C., divided into twentieths of a degree. Nos. 2–4 provided with zero point graduations for checking purposes. Complete in case .... per set *d* £10 0 0

National Physical Laboratory Certificates for above, tested at every 5° to nearest ·01°	extra per set	*n*	£4	4 0
Any of the above thermometers supplied separately in a wood case	each	*d*	£2	10 6
National Physical Laboratory Certificates, tested at every 5° to nearest ·01°	extra each	*n*	£1	1 0

TH8 Thermometers, Standard "B," of normal glass, finely divided for accurate reading, Centigrade scale.

Length	18 in.	15 in.	14 in.	15 in.	14 in.
Range	−5° to 100° C.	−5° to 50° C.	−5° to 50° C.	50° to 105° C.	50° to 105° C.
Subdivided in	$\frac{1}{5}$°	$\frac{1}{10}$°	$\frac{1}{5}$°	$\frac{1}{10}$°	$\frac{1}{5}$°
Price	*d* 30/6	*d* 25/6	*d* 22/6	*d* 28/6	*d* 25/-
Extra for N.P.L. Certificate for every 10° C. to nearest 0·05° C. Class A	*n* 18/3	*n* 11/-	*n* 11/-	*n* 11/-	*n* 11/-

TH10 Thermometers, Standard "B," of normal glass, finely divided for accurate reading, Fahrenheit scale.

Length	18 in.	15 in.	14 in.	15 in.	14 in.
Range	20° to 220° F.	20° to 120° F.	20° to 120° F.	120° to 220° F.	120° to 220° F.
Subdivided in	$\frac{1}{2}$°	$\frac{1}{5}$°	$\frac{1}{2}$°	$\frac{1}{5}$°	$\frac{1}{2}$°
Price	*d* 30/6	*d* 25/6	*d* 22/6	*d* 28/6	*d* 25/-
Extra for N.P.L. Certificate at every 20° F. to nearest 0·1° F. Class A	*n* 17/-	*n* 11/-	*n* 11/-	*n* 11/-	*n* 11/-

TH12

TH12 **Thermometers, Standard "B," Anschutz's pattern,** of normal glass, engraved scale, in set of seven, covering range −10° to 360° C., subdivided in one-fifths as follows, in morocco case, length about 15 centimetres.

No.	1	2	3	4
	−10° to + 55°	50° to 105°	100° to 155°	150° to 205°
No.	5	6	7	
	200° to 255°	250° to 305°	300° to 360°	

Price of complete set, *d* **£7 5 0**; with National Physical Laboratory Certificate for each *d* **£11 5 0**

Thermometers Nos. 2 to 7 are provided with graduations 15° to 20° C. below the chamber for testing purposes, and Nos. 3 to 7 are filled with nitrogen to prevent distillation of mercury.

TH14 **Thermometers, Standard "C,"** of normal glass, finely divided for accurate reading. High range. Filled with nitrogen in accordance with the regulations of the National Physical Laboratory.

Length	18 in.	18 in.	18 in.	18 in.
Range	−5° to 205° C. in $\frac{1}{2}$°	−5° to 305° C. in $\frac{1}{2}$°	0° to 400° F. in 1°	0° to 600° F. in 1°
Price	*d* **41/-**	*d* **45/-**	*d* **41/-**	*d* **45/-**
Extra for N.P.L. Certificate every	20°	25°	30° or 40°	50°
Price	*n* **20/-**	*n* **27/-**	*n* **20/-**	*n* **27/-**
Length	18 in.	20 in.	18 in.	20 in.
Range	−5° to 360° C. in $\frac{1}{2}$°	−5° to 420° C. in 1°	0° to 680° F. in 1°	0° to 800° F. in 2°
Price	*d* **51/-**	*d* **51/-**	*d* **51/-**	*d* **51/-**
Extra for N.P.L. Certificate every	50°	50°	100°	100°
Price	*n* **21/-**	*n* **24/-**	*n* **21/-**	*n* **24/-**

TH16 **Thermometers, Standard "D,"** nitrogen filled under great pressure, Centigrade scale.

Length	20 in.	20 in.	20 in.
Range	0° to 500° C. in 1°	0° to 550° C. in 1°	200° to 550° C. in 1°, with 0° point graduations
Price	*d* **61/-**	*d* **67/6**	*d* **74/6**
Extra for N.P.L. Certificate (up to 450° C. only) every	50°	50°	50°
Price	*n* **35/-**	*n* **35/-**	*n* **28/-**

TH18 **Thermometers, Standard "D,"** nitrogen filled under great pressure, Fahrenheit scale.

Length	20 in.	20 in.	20 in.
Range	0° to 900° F. in 2°	0° to 1000° F. in 2°	400° to 1000° F. in 2°, with 32° point graduations
Price	*d* **61/-**	*d* **67/6**	*d* **74/6**
Extra for N.P.L. Certificate (up to 840° F.) every	100°	100°	100°
Price	*n* **35/-**	*n* **35/-**	*n* **28/-**

Thermometers, Standard "D," 500° C. and 900° F., are made of Borosilicate glass with enamelled back; above these ranges, of Combustion glass with ground back.

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TH20-TH26

TH20 **Thermometers, Standard " E,"** of normal glass, in sets of seven instruments covering the range 0° to 360° C., about 55° C. on each thermometer. The instruments showing above 100° C. filled with nitrogen and provided with zero point graduations. Length, 12 in.

No.	1	2	3	4
Range	5° to 50° C. in $\frac{1}{5}$°	45° to 105° C. in $\frac{1}{5}$°	100° to 155° C. in $\frac{1}{5}$°	150° to 205° C. in $\frac{1}{5}$°
Price	*d* **18/6**	*d* **21/-**	*d* **30/6**	*d* **31/6**

No.	5	6	7
Range	200° to 255° C. in $\frac{1}{5}$°	250° to 305° C. in $\frac{1}{5}$°	300° to 360° C. in $\frac{1}{5}$°
Price	*d* **35/-**	*d* **38/-**	*d* **40/-**

TH22 The above set complete in morocco case .... *d* **£11 0 0**

TH24 If required with National Physical Laboratory Certificate, the extra cost will be :

Thermometer No.	1	2	3	4	5	6	7
N.P.L. Certificate every	10°	10°	10°	10°	10°	10°	10°
Price	*n* **11/6**	*n* **11/6**	*n* **14/6**	*n* **14/6**	*n* **20/-**	*n* **20/-**	*n* **20/-**

TH26 Price complete with Certificates .... *d* **£16 12 0**

TH28 **Thermometers, Standard " E,"** of normal glass, set of four thermometers covering from 0° to 400° C., the last three instruments being filled with nitrogen and provided with zero point graduations. Length, 14 in., subdivided in $\frac{1}{2}$°.

No.	1	2	3	4 (borosilicate glass)
Range	−5° to 105° C.	95° to 205° C.	195° to 305° C.	295° to 405° C.
Price	*d* **20/6**	*d* **35/-**	*d* **36/-**	*d* **45/-**

The above set complete in morocco case .... *d* **£7 12 6**

If required with National Physical Laboratory Certificate, the extra cost will be :

Thermometer No.	1	2	3	4
N.P.L. Certificate every	10°	20°	20°	20°
Price	*n* **18/6**	*n* **15/-**	*n* **20/-**	*n* **20/-**

TH30 Price complete with Certificates .... *d* **£11 6 0**

TH32-TH34

TH32 Thermometers, Standard " E," of normal glass, set of four thermometers covering from 0° to 400° C., the last three instruments being filled with nitrogen and provided with zero point graduations. Length, 18 in., subdivided in $\frac{1}{5}$°.

No.	1	2	3	4 (borosilicate glass)
Range	−5° to 105° C.	95° to 205° C.	195° to 305° C.	295° to 405° C.
Price	*d* **30/6**	*d* **45/-**	*d* **47/6**	*d* **57/-**

The above set complete in morocco case .... *d* **£9 9 0**

If required with National Physical Laboratory Certificate, the extra cost will be :

No.	1	2	3	4
N.P.L. Certificate every	10°	10°	10°	10°
Price	*n* **18/6**	*n* **23/-**	*n* **33/-**	*n* **35/-**

Price complete with Certificates .... *d* **£14 18 6**

The sets quoted can be supplied graduated in Fahrenheit scale in 1° and $\frac{1}{2}$°, corresponding with the Centigrade $\frac{1}{2}$° and $\frac{1}{5}$° at the same prices ; and can also be supplied graduated in $\frac{1}{8}$° F. and $\frac{1}{10}$° C. at extra charge in proportion.

NOTE CONCERNING THERMOMETERS WITH ZERO POINT GRADUATIONS.

At normal temperatures the enlargement in the bore is partly filled with mercury. Should small particles become separated in transit or handling, as sometimes occurs, the thermometer should be heated carefully until the mercury reunites, which it will readily do provided the separated particle of mercury has not closed the upper end of the enlargement against the passage of the enclosed nitrogen. In such case the mercury must first be dislodged by tapping the bulb or by using greater heat to cause the mercury to unite in the chamber at the top end of the bore.

If preferred, these thermometers can be provided with graduations at about 15° or 20° C. instead of at 0° ; by this means the mercury at normal temperatures is in the capillary below the enlargement, and the risk of separation reduced to a minimum.

When heating the bulb of Standard Thermometers, the precaution should always be taken to place the bulb inside a small test tube to avoid contact with the flame.

TH34 Thermometers, Standard " F," of normal glass, nitrogen filled, and annealed to avoid any serious change of zero ; length about 12 in. The thermometers are good quality, and would pass the National Physical Laboratory, but are not of the standard accuracy of Thermometer Standards A to E.

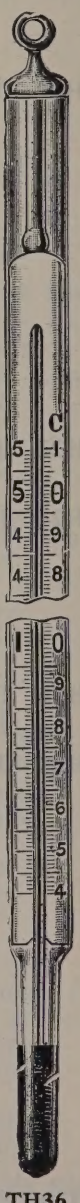
Range	0° to 200° C. in 1°	0° to 300° C. in 1°	0° to 400° C. in 1°
Or	30° to 400° F. in 1°	30° to 600° F. in 2°	30° to 750° F. in 2°
Price	*d* **18/6**	*d* **21/-**	*d* **30/6**
Extra cost of N.P.L. Certificate at every	25° C. or 45° F.	50° C. or 90° F.	50° C. or 90° F.
Price	*n* **16/-**	*n* **20/-**	*n* **24/-**

TH36 Thermometers, with enclosed milk glass scale, Standard " G," scale fused to the outer sheath by a special joint, Centigrade scale.

Length	18 in.	15 in.	18 in.
Range	−5° to 105° C.	−5° to 50° C.	−5° to 50° C.
Subdivided in	$\frac{1}{5}$°	$\frac{1}{5}$°	$\frac{1}{10}$°
Price	*d* **38/-**	*d* **25/-**	*d* **34/-**
N.P.L. Certificate at every 10° C. to nearest 0·05° C., extra	*n* **18/-**	*n* **11/-**	*n* **11/-**

Length	15 in.	18 in.
Range	50° to 105° C.	50° to 105° C.
Subdivided in	$\frac{1}{5}$°	$\frac{1}{10}$°
Price	*d* **28/6**	*d* **37/-**
N.P.L. Certificate at every 10° C. to nearest 0·05° C., extra	*n* **11/-**	*n* **11/-**

Above thermometers have bulbs of normal glass, and are annealed to prevent zero changes.



TH36

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TH37 Thermometers, with enclosed milk glass scale, similar to TH36, **but second grade.**
Centigrade scale.

Length	16 in.	12 in.	16 in.	12 in.	16 in.
Range	0° to 100° C.	0° to 100° C.	0° to 50° C.	0° to 50° C.	50° to 100° C.
Subdivided in	$\frac{1}{5}$°	$\frac{1}{2}$°	$\frac{1}{10}$°	$\frac{1}{5}$°	$\frac{1}{10}$°
Price	*b* **17/-**	*b* **13/6**	*b* **17/-**	*b* **13/6**	*b* **17/-**

Length	12 in.	16 in.	12 in.
Range	50° to 100° C.	100° to 150° C. or 150° to 200° C.	100° to 150° C. or 150° to 200° C.
Subdivided in	$\frac{1}{5}$°	$\frac{1}{10}$°	$\frac{1}{5}$°
Price	*b* **13/6**	*b* **22/6**	*b* **18/6**

TH39

TH40

TH39 Thermometers, Beckmann's, for cryoscopic method, reading 0° to −6° C., each degree divided into hundreds .... each *b* **£1 10 0**

TH40 Thermometers, Beckmann's, for ebullioscopic method, reading 0° to +6° C., each degree divided into hundreds .... each *b* **£1 10 0**

TH41 High Temperature Thermometers, mercury, filled with nitrogen under pressure, in wood cases.

Length	14	14	16	18	18 in.
Range	360° C.	400° C.	450° C.	500° C.	550° C.
Divided in	$\frac{2}{1}$°	$\frac{2}{1}$°	$\frac{2}{1}$°	$\frac{2}{1}$°	$\frac{2}{1}$°
Price	*d* **9/-**	*d* **9/6**	*d* **16/-**	*d* **20/-**	*d* **24/-** each.

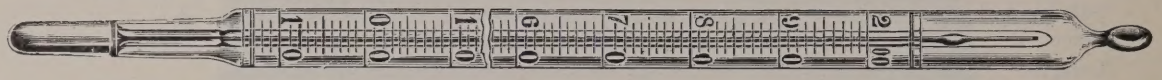
Any special range or length made to order.

TH42 Engraved English Chemical Thermometers, accurately made, engraved scale, but without certificate, length about 12 in., stout glass, nitrogen filled, in wood case. Within N.P.L. tolerance.

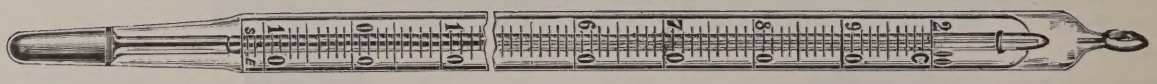
Range	30° to 220° F.	30° to 400° F.	30° to 600° F.
Divided into....	1°	2°	2°
Price	*d* **7/6**	*d* **9/-**	*d* **10/6** each.
Range	0° to 110° C.	0° to 200° C.	0° to 360° C.
Divided into....	1°	1°	2°
Price	*d* **7/6**	*d* **9/-**	*d* **10/6** each.

TH44 **Thermometers,** Jena glass, for cold mixtures and liquid air, etc., milk glass scale, +30° C. to −120° C. in single degrees, toluene filled .... each *d* **£1 7 0**

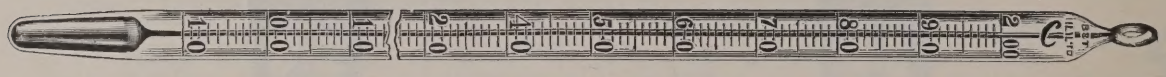
TH46 **Thermometers,** ditto, +30° C. to −200° C., pentane filled.... .... ,, *d* **£2 10 0**



TH48



TH50



TH52

★**TH48 Thermometers,** for chemical and physical use, about 13 in. long and about ¼ in. thick, paper scale, **in stout cardboard cases.**

Range	110°	200° C.	Nitrogen filled.
Divided in	1° / 1	1° / 1	
Or	220°	400° F.	
,, ...	1° / 1	2° / 1	
Price	*b* **2/3**	*b* **2/6**	each.
,, ...	*b* **25/-**	*b* **27/6**	per dozen.

★**TH50 Thermometers,** for chemical use, about 13 in. long and about ¼ in. thick, milk glass scale, **in stout cardboard cases.**

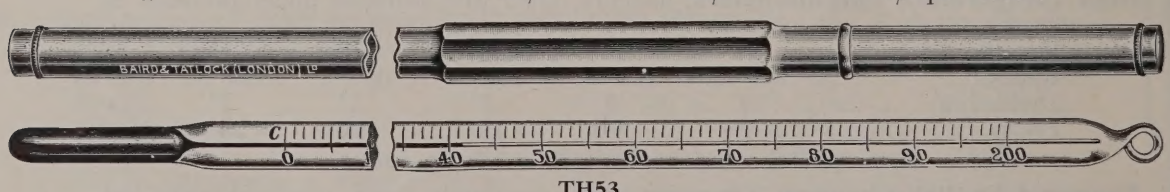
Range	110°	200°	360° C.	Nitrogen filled.
Divided in	1° / 1	1° / 1	2° / 1	
Or	220°	400°	600° F.	
,, ...	1° / 1	2° / 1	2° / 1	
Price	*b* **2/3**	*b* **2/6**	*b* **3/3**	each.
,, ...	*b* **25/-**	*b* **27/6**	*b* **36/-**	per dozen.

TH51 **Thermometers,** for chemical use, about 13 in. long and about ¼ in. diameter, engraved scale on stem, enamelled back, **in stout cardboard cases.**

Range	110°	200°	360° C. (nitrogen filled).	
Divided in	1° / 1	1° / 1	2° / 1	
Price	*b* **3/-**	*b* **3/3**	*b* **4/-**	each.
,, ...	*b* **33/-**	*b* **36/-**	*b* **44/-**	per dozen.

TH52 **Thermometers,** as above.

Range	220°	400°	600° F. (nitrogen filled).	
Divided in	1° / 1	2° / 1	2° / 1	
Price	*b* **3/3**	*b* **3/9**	*b* **4/6**	each.
,, ...	*b* **36/-**	*b* **42/-**	*b* **51/-**	per dozen.



TH53

TH53 **Thermometers,** for chemical work, of **English glass** with **Jena** bulbs, engraved scale, length about 12 in., correct to within half degree at lower ranges and one degree at higher ranges. **Best English manufacture,** in metal cases, nickelled, with pull-off covers. Within N.P.L. tolerance.

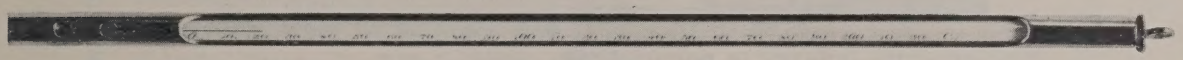
	A in 1° / 1	B in 1° / 1	C in 2° / 1	D in 1° / 1	E in 2° / 1	F in 2° / 1
Range	0° to 110° C.	0° to 200° C.	0° to 360° C.	0° to 220° F.	0° to 400° F.	0° to 600° F.
Price	*b* **5/6**	*b* **6/-**	*b* **7/-**	*b* **5/6**	*b* **6/-**	*b* **7/-** each.

Specially tested. Special prices for quantities.

TH54

TH54 Thermometers, English normal glass, engraved scale, enamelled back, small bulbs, for chemical and physical work, in turned wood cases.

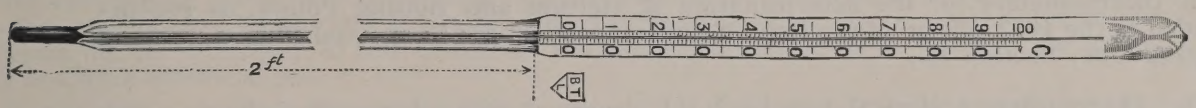
Range	0° to 50° C.	0° to 100° C.	50° to 100° C.	50° to 150° C.
Divided into	$\frac{1}{10}$°	$\frac{1}{5}$°	$\frac{1}{10}$°	$\frac{1}{5}$°
Price	*b* **5/6**	*b* **5/6**	*b* **6/-**	*b* **6/-** each.



TH51-54

Sheathed Chemical Thermometers. Any of Nos. TH51, TH52, TH53, TH54 can be supplied in a brass sheath either lacquered or nickel-plated, as figured, at an extra charge of *b* **£0 5 0**

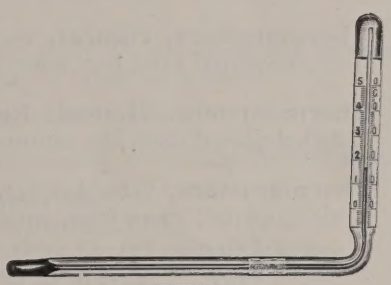
TH60



TH62

TH64

WHEN apparatus is urgently required and is not ordered directly from us, an advance copy of order will materially hasten delivery.



TH66

TH60 Thermometers, dairy, paper scale, about $10 \times \frac{5}{8}$ in., range about 230° F., indicating freezing, churning, cheese, and scalding .... each **2/6**; per doz. *b* **£1 8 0**

TH62 Thermometers, for chemical use, stem 2 ft. long, graduated scale about 1 ft., total length 3 ft., milk glass scale enclosed in outer tube.

Range	0° to 110°	200°	360° C.	212°	400°	600° F.
Price	*b* **18/9**	*b* **18/9**	*b* **21/9**	*b* **18/9**	*b* **18/9**	*b* **21/9** each.

TH64 Thermometers, about 14 in. long, stem 10 in., scale 4 in. at top, **suitable for incubators, etc.,** with red line at 37° C.

Range	0° to 50°	0° to 100°	50° to 100° C.
Price	*b* **7/6**	*b* **7/6**	*b* **7/6** each.

TH66 Thermometer, milk glass scale, with stem bent at angle 0–50° C., for incubators, etc.

A. To read on right when facing incubator .... each *b* **£0 8 6**

B. To read on left when facing incubator .... ,, *b* **£0 8 6**

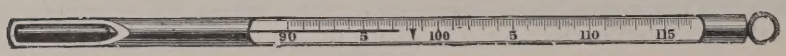
TH68 Thermometers, for testing benzole, engraved on stem, small bulb, range 70° to 130° C., in $\frac{1}{5}$ths, length about 15 in. .... each *b* **£0 8 6**

TH70 Thermometers, for testing naphtha, 90° to 200° C., in half degrees, engraved on stem ,, *b* **£0 8 6**

TH76

TH78

TH80



TH82

TH71 **Thermometer for Embedding Baths,** overall length 9 in., stem 4 in., milk glass scale, 0° to 100° C. in 1° divisions .... each *b* **£0 7 0**

For thermometers for the determination of Melting and Boiling Points, as recommended in the 1932 edition of the British Pharmacopœia, see Drugs and Pharmaceutical Preparations, Section IX.

TH76 **Thermometers, clinical,** tested at N.P.L., lens front, with indestructible index, in nickel-plated case, one minute, 4 in. long .... each *b* **2/-**; special prices for quantity.

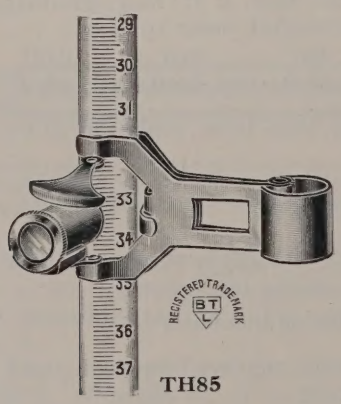
TH78 **Thermometers, clinical,** tested at N.P.L., lens front, with indestructible index, in nickel-plated case, half minute, 4 in. long, ... each *b* **2/3**; per doz. *b* **£1 5 0**

TH80 **Thermometers, clinical, English make,** broad bore, with indestructible index, in nickel-plated case, one minute, 4 in. long .... each *b* **1/9**; per doz. *b* **£0 19 0**

TH82 **Thermometers,** veterinary clinical, broad bore, English make, indestructible index, in nickel-plated screw case, with flattened brass end protecting the bulb when in use.

Length	6	8	10 in.
Price	*b* **5/6**	*b* **9/-**	*b* **12/-** each.

TH84 **Clinical Charts,** for veterinary use, etc., size 11 × 8 in., to last one month, two readings being taken each day .... per 100, *b* **7/6**; per 1000 *b* **£3 10 0**



TH85

TH85 **Thermometer Magnifiers** .... each *e* **£0 8 6**

INDUSTRIAL THERMOMETERS

EVERY industry requires in some form or other **THERMOMETERS,** on whose accuracy will depend very largely the successful working of its plant or process.

The variety of types is infinite and this list is intended to illustrate a few of the more common forms of Industrial Thermometers.

A thermometer should possess the following qualities :—

A. Accurate calibration.
B. Calibration to correct immersion.
C. Bulb should be of thermometric glass tested by the National Physical Laboratory.
D. Careful annealing.
E. Safety chamber of suitable size.
F. Careful fitting to case to allow of expansion at varying temperatures.
G. Nitrogen filled at suitable pressure in order to ensure that the mercury does not part or jump when used continually at high temperatures.

All these qualities are incorporated in our thermometers.

As manufacturers we shall be pleased to quote for special patterns, and make up samples to suit individual requirements.

The prices quoted are for single thermometers. Special prices will be given for quantities.

THE temperature scales specified for each type of thermometer are those most commonly used, but any other range up to a limit of 600° F. can be supplied at the same price. The scales can also be graduated in Centigrade degrees if required; or both Centigrade and Fahrenheit degrees can be shown on the same scale, the latter at a small additional cost.

It should be understood that, unless otherwise stated, the thermometers ranged to 600° F. have tubes of ordinary glass, and are therefore not suitable for **continuous use** at the higher range, although intermittent use is not detrimental in any way.

If required for continuous use at high temperatures, it is advisable to have the thermometer tubes made of borosilicate glass, also to restrict the lower limit in order to open the scale as much as possible.

Prices for thermometers with borosilicate tubes will be sent on receipt of particulars.

We manufacture thermometers for every purpose and for every class of user, including the following :—

Poultry Breeders.
Refrigerating Engineers.
Hot Water Engineers.
Dairy Engineers.
Boiler Makers.
Evaporating Plant Makers.
Sweet and Chocolate Manufacturers.
Chemical and Drug Manufacturers.
Patent Food Manufacturers.
Essence Distillers.

Brewing.
Sugar Boiling.
Jam and Preserve Making.

Laundries.
Mill Furnishers.
Nautical Instrument Makers.
Oven Builders.
Ship's Store Merchants.
Soap Makers.
Varnish and Paint Manufacturers.
Printers' Ink Makers.
Railway and Steamship Co.'s.
Anglers.
Tar Distillers.

Ventilating Fans.
Heating Apparatus and Appliances.
Baking.

In ordering thermometers which are to be fitted into existing fittings, please give particular attention to correct size and type of the threads, lengths of stem, whether of steel or brass, open or closed, single or revolving cover, definite range to be covered, whether Fahrenheit or Centigrade scale, metal or opal; figures or graduations, if any, to be prominently expressed in red.

If for low temperatures, these patterns can be fitted with a non-conducting material, which insulates the metallic stem from the case exposed to higher temperatures, etc.

N.B.—In all long-stem thermometers, it is essential for accurate calibration that the length of the stem to be immersed be clearly stated.

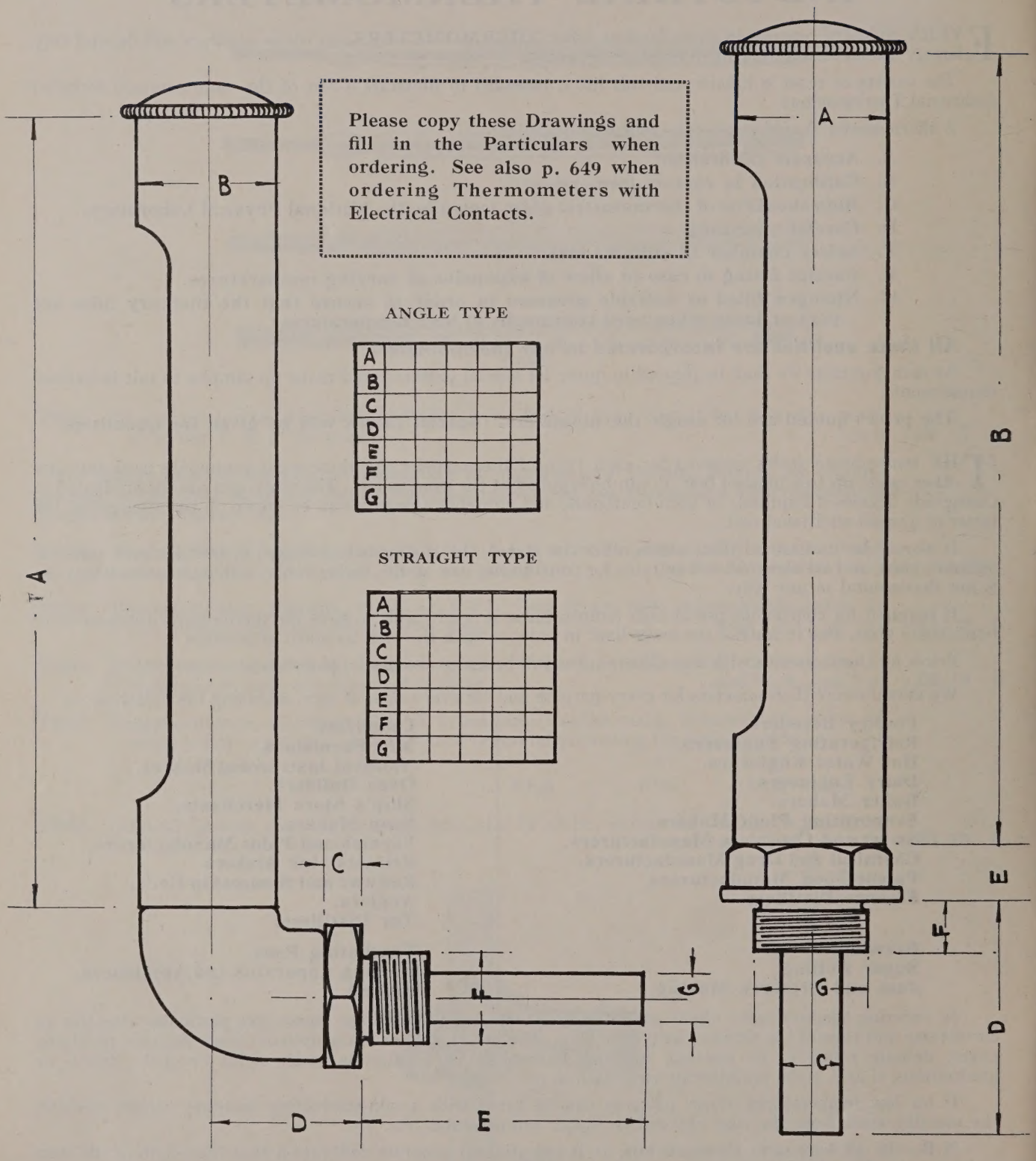
Please copy these Drawings and fill in the Particulars when ordering. See also p. 649 when ordering Thermometers with Electrical Contacts.

ANGLE TYPE

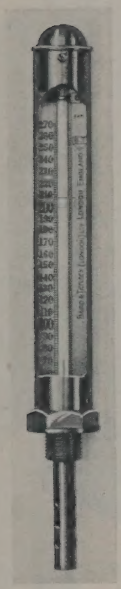
A					
B					
C					
D					
E					
F					
G					

STRAIGHT TYPE

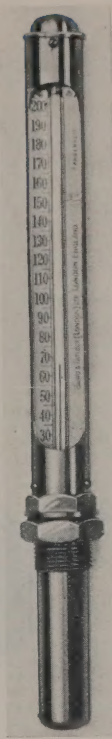
A					
B					
C					
D					
E					
F					
G					



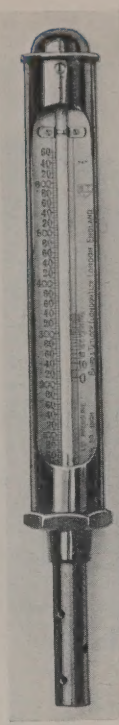
Please state exact requirements as to thread and length of stem.



TH128

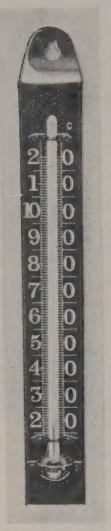


TH130

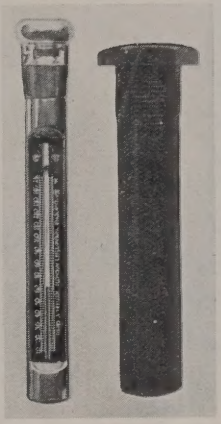


TH134

TH136



TH138



TH140

Note.—Stems can be screwed with any required thread up to 1 in. B.S. at the quoted price.
Extra lengths of *steel* stem supplied at an extra cost of 4/6 per foot, or part of foot.
Stems of brass, copper, or monel metal, to resist the corrosive action of acids and alkalies, quoted on receipt of particulars.
All threads are British Standard Gas unless otherwise ordered.

TH128 **Pipe Thermometers,** lacquered brass cased, range 60° to 220° F. or as required, for use with boilers, tanks, pipes, pressure vessels, cooling plants, etc.

	Single Cover.	Revolving Cover.	
8 in. head, base screwed as required up to 1 in. B.S. Gas each	*d* **21/9**	*d* **24/9**	Stems
10 in. ,, ,, ,, ,, ,, ... ,,	*d* **24/6**	*d* **27/6**	up to
12 in. ,, ,, ,, ,, ,, ... ,,	*d* **27/6**	*d* **30/6**	6 in. long

TH130 **Pipe Thermometers,** 10 in. head, 3½ in. stem, metal scale figured in red, white, or black, range 0° to 200° F. and provided with hard rolled steel mercury well.
Complete with mercury well .... each *d* **£1 14 6**
Without mercury well .... ,, *d* **£1 3 6**

TH132 **Pipe Thermometers,** as TH130, but with head 15 × 1¾ in. lens tube, scale of silvered metal or opal glass, figured in red, white or black, range 50° to 230° F. stem 3 in. long, fitted with hard rolled steel mercury well, screwed as required.
Complete with mercury well .... each *d* **£2 15 0**
Without mercury well .... ,, *d* **£2 1 6**

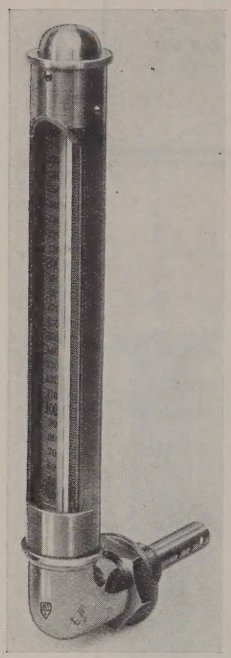
TH134 **Pipe Thermometers,** with degrees and lbs. pressure scale for indicating pressure by temperature of steam; opal glass or metal scale, figured in red, white or black; head 9⅞ in. long, scale 8 × 1¾ in. long with half shutter; standard scale shows 600° F. and 100 lbs. pressure; with stem up to 6 in. long .... each *d* **£2 2 0**

TH135 **Brine Pipe Thermometer,** lacquered brass case pattern as TH128, with opal glass scale, lens front spirit tube, range −20° F. to +80° F. .... each *d* **£1 1 0**

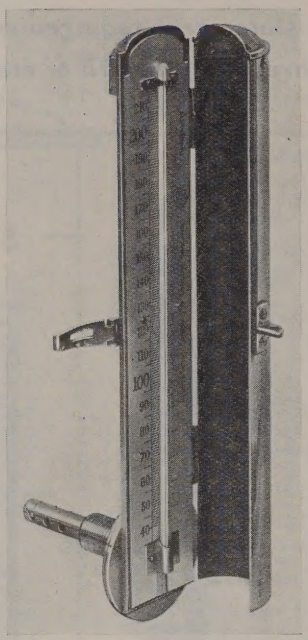
TH136 **Hot Water Thermometers,** cast brass frame with iron pocket, metal scale 6 in. × 1½ in. figured in red, white or black, range 60° to 220° F. For Radiators and House Installations .... each *d* **£0 17 6**

TH138 **Thermometers,** bronzed metal scale with bold white figures and divisions, range 20° to 120° C. This type is extensively used in the process of silk manufacture. each *d* **£0 5 9**; per doz. *d* **£3 3 0**; per gross *d* **£30 12 0**

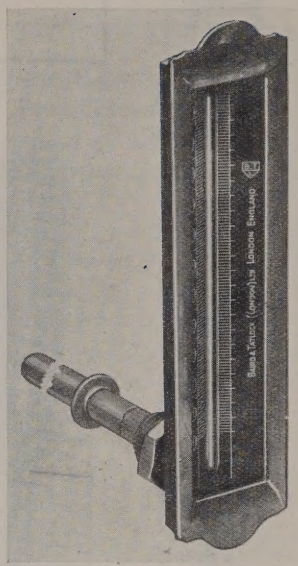
TH140 **Gas Main Thermometers,** in cast metal case, with outer case screwed 1 in. gas, opal glass scale, range 20° to 140° F. .... each *d* **£0 14 9**



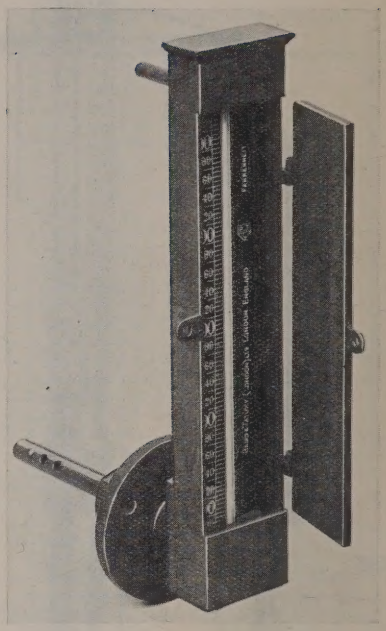
TH142



TH144



TH146



TH148

NOTE.

Stems can be screwed with any required thread up to 1 in. B.S. at the quoted price.
Extra lengths of *steel* stem supplied at an extra cost of 4/6 per foot, or part of foot.
Stems of brass, copper, or monel metal, to resist the corrosive action of acids and alkalies, quoted on receipt of particulars.
All threads are British Standard Gas unless otherwise ordered.

TH142 Angle Thermometers, metal scale, lacquered brass cased, range 60° to 220° F. or as required, for use with boilers, tanks, pipes, etc.

	Single Cover.	Revolving Cover.	
8 in. head, base screwed up to 1 in. B.S. Gas as required	*d* **38/6**	*d* **40/6**	Stems up to 6 in. long
10 in. ,, ,, ,, ,, ,, ,, ...	*d* **42/9**	*d* **45/9**	
12 in. ,, ,, ,, ,, ,, ,, ...	*d* **48/-**	*d* **51/-**	
If fitted with flange 3½ in. diam.		extra *d* **9/-**	
If fitted with back nut		,, *d* **3/3**	

TH144 Thermometers, lacquered brass frame, with a half round door of brass, size 12 × 2 in., fitted to flat metal scale. Figured in red, white or black; range 60° to 220° F. or as required. This type is largely used by brewers, etc., for secret work, as the scale case can be locked up.

With stem up to 6 in. long as required .... each *d* **£3 7 6**

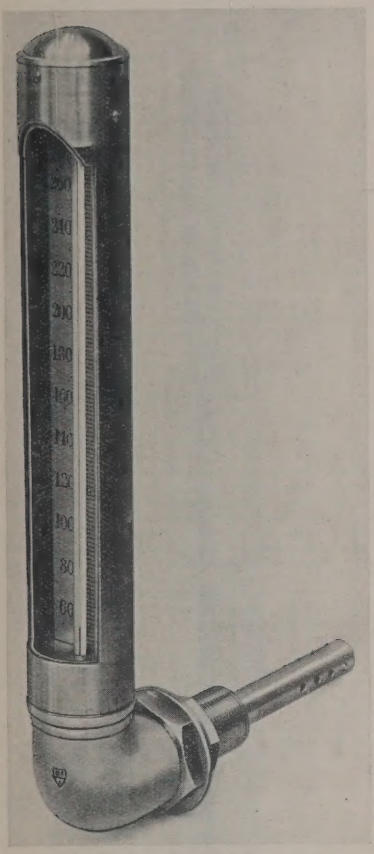
Padlock, *d* **1/6** extra.

TH146 Angle Thermometers, V-shaped scale, nickel-plated brass frame, black with white figures, loose union nut, 10 in. head, 10 in. stem, lens tube, range 0° to 220° F. Screwed any thread up to 1 in. B.S. as required. Specially arranged for insulated vessels .... each *d* **£4 11 6**

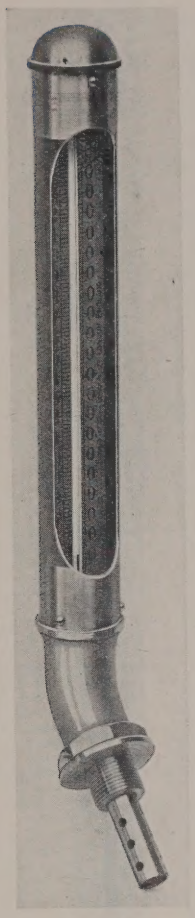
TH148 Tar Thermometers, strong enamelled iron case, 11 × 2 in. with glass window and metal door. Brass flange and fittings with steel back nut for fixing in insulated boilers. Metal or opal scale figured in red, white or black. Stem up to 6 in. long as required. Range 100° to 500° F. .... each *d* **£2 17 0**

Padlock, *d* **1/6** extra.

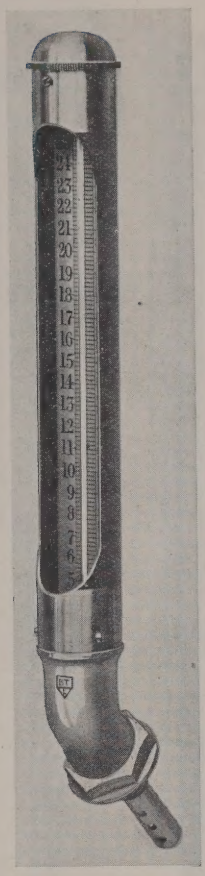
TH150 Tar Thermometers, as above, but without door .... each *d* **£2 13 6**



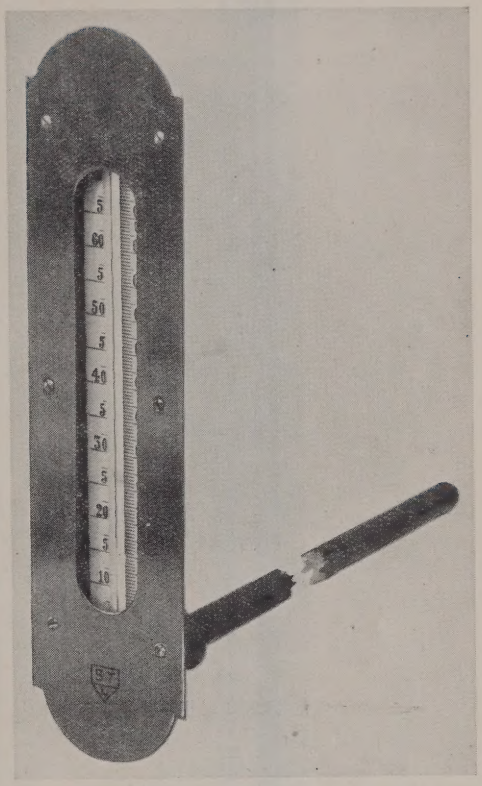
TH152



TH154



TH156



TH158

NOTE.

Stems can be screwed with any required thread up to 1 in. B.S. at the quoted price.
Extra lengths of *steel* stem supplied at an extra cost of 4/6 per foot or part of foot.
Stems of brass, copper, or monel metal, to resist the corrosive action of acids and alkalies, quoted on receipt of particulars.
All threads are British Standard Gas unless otherwise ordered.

TH152 **Angle Thermometers,** large pattern, lacquered brass, metal scale, head 12 × 2 in., scale 10 × 1½ in., range 60° to 260° F.

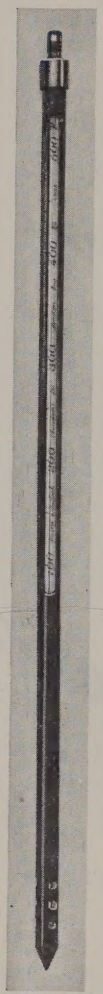
With stem up to 9 in. long as required	....	each	*d* £4 2 6
If fitted with flange 5 in. diam.	....	extra	*d* £0 11 3
If fitted with back nut	....	„	*d* £0 5 3

TH154 **Eccentric Angle Thermometers,** Air Ministry pattern, lacquered brass, with bold scale and oval section mercury column, for reading at a distance of 8 ft., head 11 × 1⅝ in., brass stem 2¾ in. long including thread, screwed as required, silvered metal or opal glass scale figured in red, white or black, range 50° to 250° F. Set at an angle of 135° for easy reading when fitted to high tanks (longer stems made to order) .... each *d* £2 17 6

TH156 **Eccentric Angle Thermometers,** as above, but set at a suitable angle for easy reading when fitted to low tanks .... each *d* £2 17 6

TH158 **Angle Thermometers,** oven type, lacquered brass, with bold reading scale and glass window protecting face 14 × 3½ in. opal glass or metal scale, range 100° to 600° F. For use in bakers' ovens, etc.

Length of steel stem	2½ ft.	4 ft.	5 ft.
Price .... each	*d* £2 17 6	*d* £3 3 0	*d* £3 10 0



TH160

TH162

TH164

TH166-TH168

TH160 **Tar Thermometers,** solid glass stem, with bold figures and calibrations etched on the glass stem, fitted into strong steel protecting case. Total length 20 in. Scale 100° to 500° F. approx. 10 in. long .... each *d* **£0 15 9**

TH162 **Tar Thermometers,** solid glass stem, as above, but with steel case provided with revolving cover .... each *d* **£1 1 0**

TH164 **Tar Thermometers,** with stout steel tube, case fitted with revolving brass cover, total length $3\frac{1}{2}$ ft. long × $\frac{5}{8}$ in. diam., scale 12 in. long, range 100° to 500° F. .... each *d* **£1 13 0**

TH166 **Tar Thermometers,** lacquered brass cased, with steel stem, opal glass scale, range 100° to 500° F. Size of head 10 × $1\frac{3}{8}$ in.

Length of stem	2 ft.	3 ft.	4 ft.
Price each	*d* **£2 10 0**	*d* **£2 16 0**	*d* **£3 2 6**

TH168 **Tar Thermometers,** as above, but with case fitted with revolving brass cover.

Length of stem	2 ft.	3 ft.	4 ft.
Price each	*d* **£2 17 6**	*d* **£3 5 0**	*d* **£3 10 0**

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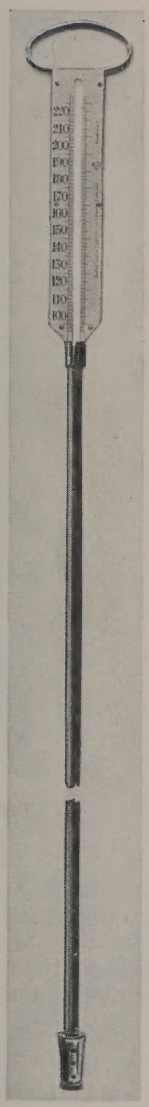
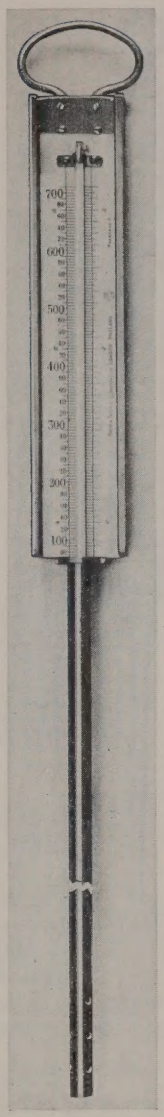
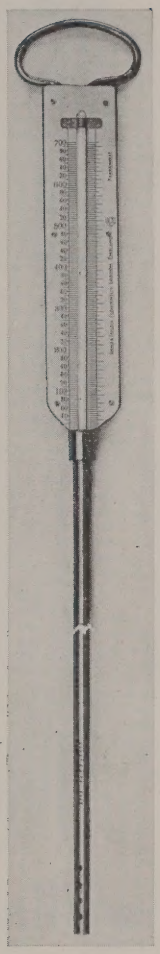


TH172



TH174



TH176

TH172 **Thermometers for mash tun,** brass frame, range 100° to 220° F.

	4 ft.	5 ft.
Length of stem		
Each	*d* £3 5 0	*d* £3 10 0

TH173 **Hot Bed Thermometers,** with flat head as TH172, copper case with brass stem, silvered scale, mercury tubes, range 0° to 150° F.

Length of stem 24 in.	each	*d* £0 19 0
,, ,, 30 in.	,,	*d* £1 2 6
Extra length of stem per ft.		*d* £0 5 6

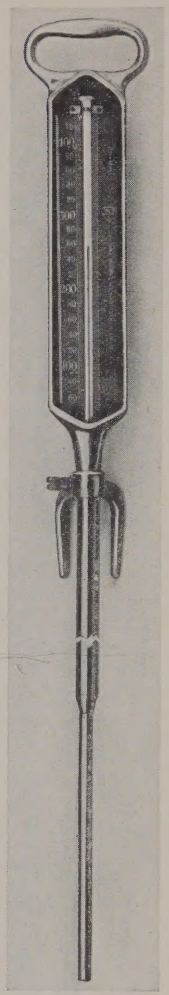
TH174 **Varnish Thermometers, 14½ in. flat head,** stout metal scale with raised sides, to prevent damage to tube, mounted on extended stem, supported with very strong cast back plate, range 60° to 600° F. or to order. For use in varnish and paint works.

	2 ft.	3 ft.	4 ft.
Length of stem, steel			
Price .... each	*d* £3 17 6	*d* £4 2 0	*d* £4 10 0

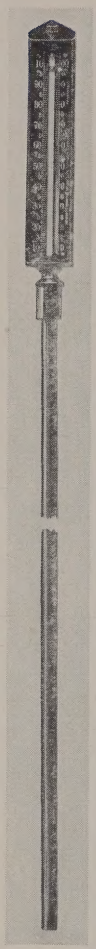
TH176 **Varnish Thermometers, 12 in. flat head** as above, but lighter pattern.

	2 ft.	3 ft.	4 ft.
Length of stem, steel			
Price .... each	*d* £2 11 0	*d* £2 15 6	*d* £3 0 0

TH178

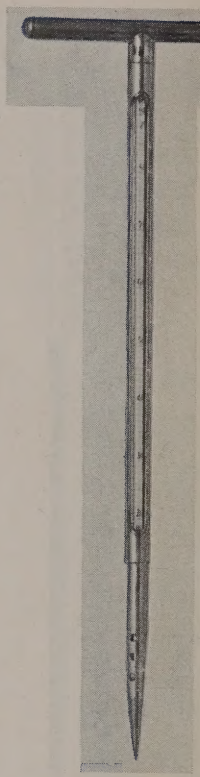


TH180



TH182

TH192



TH193

TH178 Varnish or Oil Thermometers, strong cylindrical lacquered brass case, with metal or opal glass scale, 12 in. × 2 in. round head. Stem can be made in any length up to 6 ft., open or closed as required, range 200° to 600° F. or to order. Suitable for printers' ink and varnish makers, type-founders, oil boilers, sugar refiners, and dyers, also for registering temperature of flue gases, etc.

Length of stem, steel	2 ft.	3 ft.	4 ft.
Price	each *d* £3 17 6	*d* £4 2 0	*d* £4 6 6

TH180 Jam Boiling Thermometers, with strong cast aluminium head and handle, metal scale 10 in. long, coppered stem 30 in. long with nickel-plated adjustable clip; range 20° to 240° F. Very suitable for preserve makers. Special scales can be made to suit requirements .... each *d* £5 0 0

Extra length of stem supplied at *d* 4/6 per ft.

TH182 Flue Gas Thermometers, with 10 in. cast-iron frame, steel stem 24 in. long and *boro-silicate glass* thermometer, scaled to 1000° F. This instrument is suitable for taking flue temperatures in gas works and similar undertakings .... Price *d* £4 0 0

Extra lengths of steel stem, per foot, *d* 9/-

TH192 Thermometers for Molten Metal, solder and lead baths, galvanising and tinning baths, type metal, white metal, etc. Cylindrical stout brass case, 8 in. long × 1⅜ in. diameter, fitted with a glass cylinder protecting the tube and scale. Engraved metal scale reading from 200° to 950° F., divided every 20° F. Borosilicate glass tube annealed and nitrogen-filled, with wide mercury column for easy reading. Steel stem 6 in. long protecting the glass bulb. Strong wood handle with ring at top. Overall length, 20 in. *f* £1 11 6

TH193 Bacon Thermometers, 15 in. long, in nickel-silver case, with revolving sheath, cross handle, graduated on stem, 20° to 90° F., divided every 1° .... each *d* £1 5 0

Note.—Extra lengths of *steel* stem supplied at an extra cost of 4/6 per foot, or part of foot.
Stems of brass, copper, or monel metal, to resist the corrosive action of acids and alkalies, quoted on receipt of particulars.

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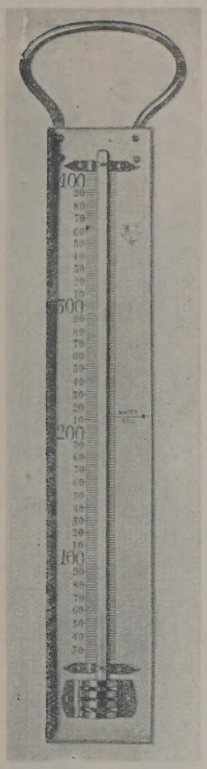
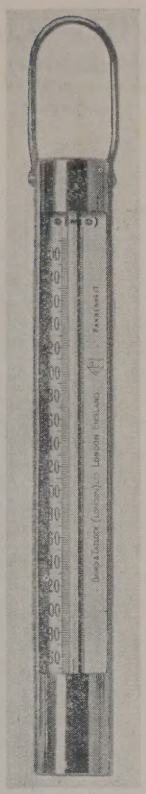
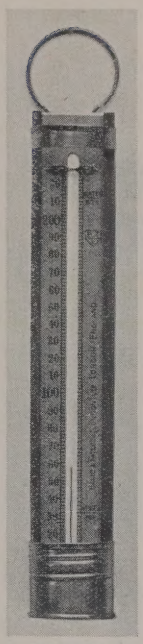


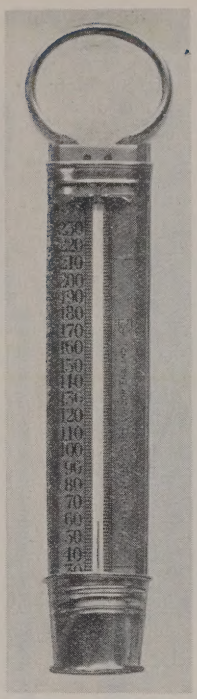
TH194



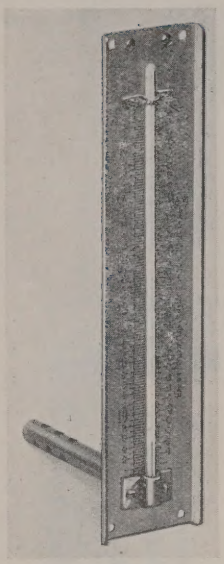
TH196



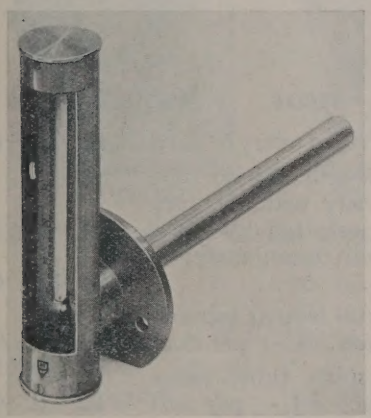
TH198



TH199-TH200



TH201



TH194 **Sugar Thermometers,** bent up lacquered brass frame with handle, graduated 0° to 400° F., divided every 5°.

Length	8	10	12	14 in.
Price	*d* **7/-**	*d* **7/9**	*d* **8/6**	*d* **10/6** each.

TH196 **Sugar Thermometers,** tubular lacquered brass case with loop handle, graduated 0° to 400° F.

Length	10	12	14	16 in.
Divided in	5°	5°	5°	2°
Price	*d* **11/6**	*d* **13/-**	*d* **15/-**	*d* **18/6** each

TH198 **Brewers' Thermometers,** in japanned tin or copper case, tubes with enamelled back, range 30° to 220° F., divided every 2°.

Length	8	10	12	14 in.
TH204 Japanned tin case	*d* **2/6**	*d* **3/2**	*d* **3/9**	*d* **4/2** each.
Copper case	*d* **3/2**	*d* **3/10**	*d* **5/-**	*d* **5/6** ,,

TH199 **Brewers' Thermometers,** in riveted copper case, with scoop, extra stout, metal scale, range 30° to 220° F., divided every 2°.

Length	10	12	14 in.
Price	*d* **15/-**	*d* **17/6**	*d* **18/9** each.

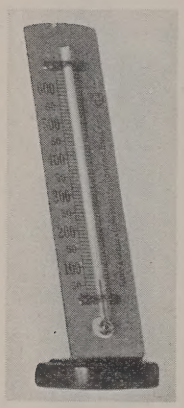
TH200 **Brewers' Thermometers,** copper case, as above, but with porcelain scale, range 40° to 80° F., divided every 1°.

Price .... 10 in., *d* **15/9**; 14 in., *d* **21/-** each.

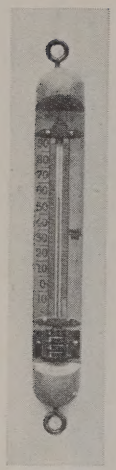
TH201 **Angle Thermometers,** silvered scale, 10 × 2¼ in. turned up sides, range 20° to 640° F., divided every 5°. For use in enamelling ovens. Stem up to 6 in. as required each *d* **£0 16 6**

TH202 **Angle Thermometers,** for ovens, as above, but with 10 in. lacquered brass scale with bent up edge provided with four fixing holes, right angle bend 3 in. long, range 60° to 450° F., divided every 5° .... each *d* **£0 13 6**

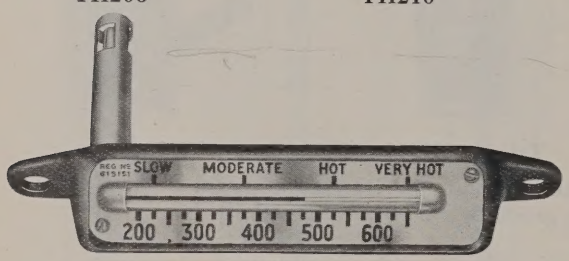
TH204 **Angle Thermometers,** brass case, head 7 3/16 × 1⅛ in. with 2 in. flange, range 60° to 600° F., divided every 5°, for use with ships' ovens, etc. With stem up to 9 in. long as required .... each *d* **£1 13 0**



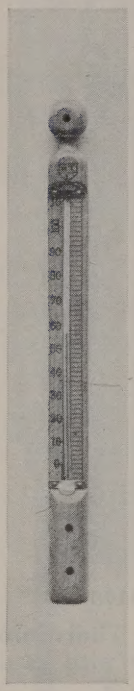
TH206



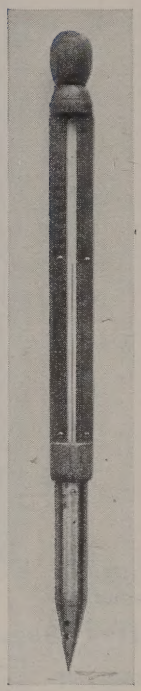
TH210



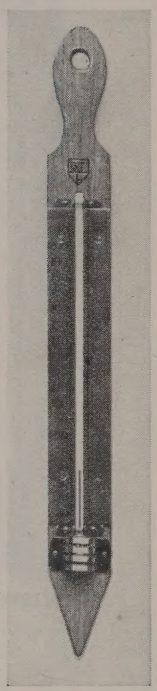
TH208



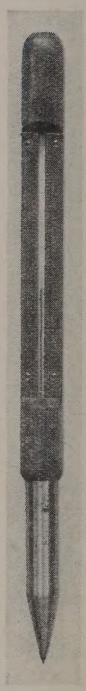
TH212



TH214



TH216



TH218

TH220

TH206 **Oven Thermometers,** 7 in., on cast-iron foot, range 50° to 600° F., divided every 5° each *d* £0 10 6

TH208 **Oven Thermometer,** improved pattern, tube of British lead glass with British blue stripe unalterable glass bulb; special flat tube with bold and easily read mercury column, scale set at a convenient angle for easy reading, bulb protected by brass tubular cover; 4 in. scale and 4 in. stem, cast metal case. Each thermometer is separately calibrated .... *d* £0 12 6

TH210 **Refrigerator Thermometers,** turned boxwood frame, 9 in., with metal loop at top and bottom, spirit tube, range −10° F. to +90° F., divided every 1° each *d* 4/-; per doz. *d* £2 5 0

TH212 **Refrigerator Thermometers,** turned boxwood frame, 11½ in., spirit tube, range −20° F. to +100° F., divided every 2° .... each *d* 4/-; per doz. *d* £2 5 0

TH214 **Hot Bed Thermometers,** short pattern, oak frame, 14½ in., with brass point, zinc scale with red spirit tube, range 0° to 150° F., divided every 2° .... each *d* £0 8 0

TH216 **Thermometers,** malt kiln, zinc scale on pointed zinc-shod oak frame, 14½ in., range 30° to 230° F., divided every 2° .... each *d* £0 8 0

TH218 **Thermometers,** malt kiln, round oak stick, brass stem, 14½ in. overall, registering maximum, range 30° to 250° F., divided every 1° .... each *d* £0 15 0

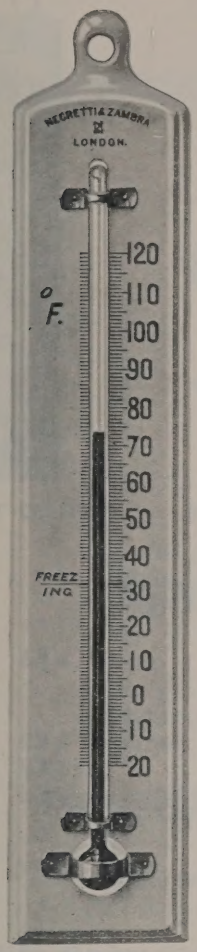
TH220 **Boxwood Thermometer,** registering maximum and minimum temperatures, Six's type, mounted on a turned mount with rings at both ends. A rubber ring at top and bottom helps to guard the thermometer against knocks. Tube divided on stem, figures and graduations on boxwood stem. Suitable for refrigerating chambers, ships' holds, etc., length 11½ in. Diameter of rubber rings 1⅛ in. Supplied with magnet for resetting indices.

Range A. +10° to 120° F., divided every 1° .... *d* £1 7 6
,, B. −20° to 50° C., ,, ,, 2° .... *d* £1 7 6

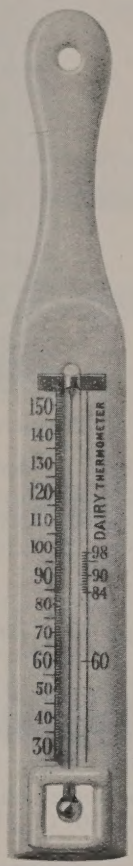
PORCELAIN WALL THERMOMETERS AND BATH THERMOMETERS.

Porcelain Thermometers are very suitable for room or workshop temperatures, or for use in cold stores, refrigerated chambers, etc.

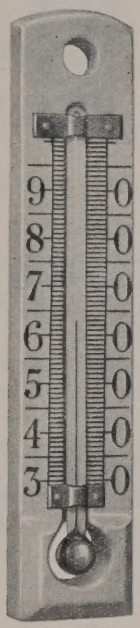
The tubes are either **mercury** or **red spirit-filled** and are mounted in glazed porcelain hollow-back mounts. The scales are marked off to each individual tube. The glazed porcelain is pure white, with the figures and graduations in black and fired on. These thermometers will withstand exposure to almost any conditions without deterioration of the scales, and are washable.



TH222



TH224



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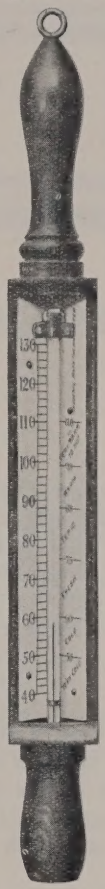
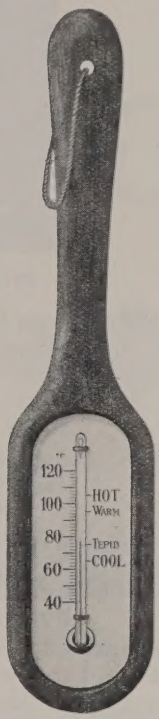
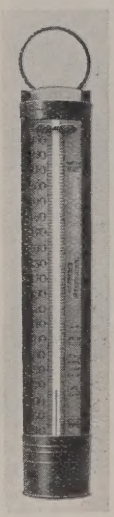


TH228



TH230


TH232

TH222 **Porcelain Thermometers,** Wall type. Spirit filled.

Range		9 in.	10½ in.	13 in.	20 in.
A.	−20° to 120° F.				
B.	30° to 100° F.				
C.	−30° to 50° C.				
D.	0° to 40° C.	*d* £0 12 6	*d* £0 15 6	*d* £1 0 0	*d* £3 15 0

TH223 Ditto. Mercury filled.

Range					
E.	60° to 180° F.				
F.	60° to 260° F.				
G.	10° to 90° C.				
H.	10° to 120° C.	*d* £0 15 6	*d* £0 18 6	*d* £1 5 0	*d* £3 19 0

TH224 **Porcelain Thermometer,** Hygienic type, suitable for Dairies, etc., with well-protected glass tube and bulb. Length 14 in., range 30° to 150° F. .... *d* £0 8 6

TH225 **Ditto,** length 7¼ in., range 30° to 100° F., suitable for malt floors, etc. .... *d* £0 6 6

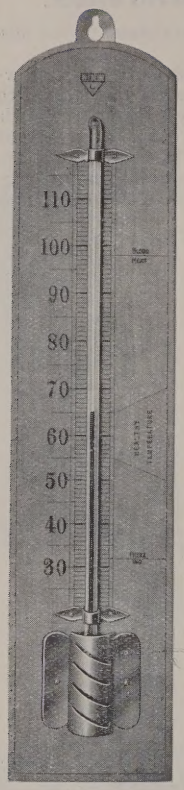
TH228 **Stirring Thermometer,** Floating type for baths, etc., well-protected tube mounted on V-shaped enamelled copper scales, wood mount in one piece. Overall length 16¼ in., range 40° to 130° F. .... *d* £0 12 6

TH230 **Stirring Thermometer,** Brush type, for baths, etc. Fitted mercury tube mounted on an enamelled scale. Range 40° to 120° F. Frame of well-seasoned oak in one piece. Overall length 14 in. .... *d* £0 7 6

TH231 **Ditto,** but range 40° to 120° F. and 5° to 50° C. .... *d* £0 8 6

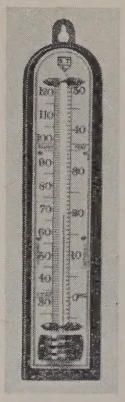
TH232 **Bath Thermometer,** Dr. Forbes' specification, porcelain scale, in copper or japanned metal case. Length .... 8 in., *d* £0 4 0; 10 in., *d* £0 5 0

BOXWOOD THERMOMETERS FOR WALLS, ROOMS, ETC.

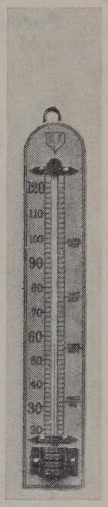


TH234

TH236



TH237–TH240



TH248–TH250

TH252–TH254

TH234 **Large Boxwood Thermometer,** for factories, institutions, lecture theatres, etc. Overall length 20 in., breadth 4½ in. ; best quality, large bore tube and bold figures for easy reading from a distance ; spirit filled, large brass guard to bulb. Range 25° to 115° F. (any range supplied to order) .... each *d* £1 6 6

TH236 **Hospital and Sick-room Thermometer,** very open bold scale with large figures, lens front, safety chamber at top, 8½ in. long, spirit filled.

Range A. 40° to 80° F. .... each *d* 3/9 ; per doz. *d* £2 1 6
,, B. 60° to 100° F. .... ,, *d* 4/- ,, *d* £2 3 0
,, C. 80° to 120° F. .... ,, *d* 4/- ,, *d* £2 3 0

NOTE.—The indication marks of correct room temperature shown in the illustration apply to temperate climates only.

Room Thermometer, best quality, polished wooden frame to choice ; engraved ivorine scale with F. and C. scales, ranges 25° to 120° F. and −5° to 50° C. ; brass guard to bulb, lens front, 8 in. long.

TH237 Mercury filled. Mahogany frame .... each *d* 8/3 ; per doz. *d* £4 11 3
TH238 ,, ,, Black wood ,, ... ,, *d* 9/- ,, *d* £4 17 6
TH239 Spirit ,, Mahogany ,, ... ,, *d* 8/- ,, *d* £4 8 9
TH240 ,, ,, Black wood ,, ... ,, *d* 8/9 ,, *d* £4 15 3

TH242 **Room Thermometer,** best quality, polished boxwood frame with bevelled edges ; sunk tube, brass guard, double scale, ranges 30° to 140° F. and 0° to 60° C. ; mercury filled. 10 in. long .... each *d* 7/9 ; per doz. *d* £4 4 9

Room Thermometer, best quality, sunk tube, brass guard, polished boxwood frame with bevelled edges, 8 in. long, mercury filled.

TH244 Single scale, F. or C., range as No. TH242 .... each *d* 3/3 ; per doz. *d* £1 14 6
TH245 Double scale, F. and C., range as No. TH242 .... ,, *d* 3/9 ,, *d* £2 1 6
Spirit filled. Reduce price by .... ,, *d* 3d. ,, *d* £0 2 6

Room Thermometer, good quality, boxwood frame, 8 in. long, range 10° to 120° F., sunk tube, brass guard.

TH248 Mercury filled .... each *d* 2/- ; per doz. *d* £1 2 6
TH250 Spirit ,, ... ,, *d* 1/9 ,, *d* £0 19 6

Room Thermometer, good quality, boxwood frame, range 10° to 120° F., 8 in. long.

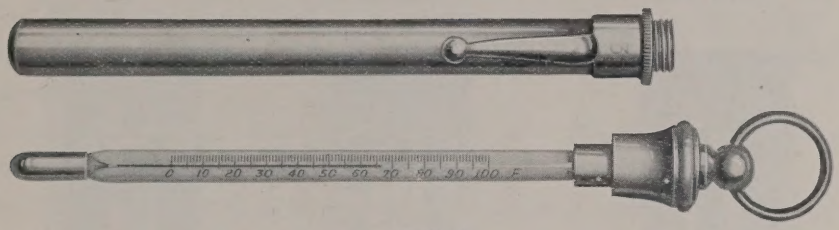
TH252 Mercury filled .... each *d* 1/9 ; per doz. *d* £1 19 6
TH254 Spirit ,, ... ,, *d* 1/6 ,, *d* £0 15 9

TH256 **Boxwood Thermometer,** suitable for refrigerating chambers, cold storage rooms, etc. Similar to No. TH254. Range −10° to 80° F. Spirit filled, safety chamber at top. each *d* 2/- ; per doz. *d* £1 2 6

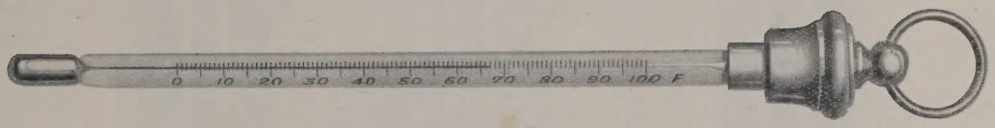
All spirit thermometers are coloured B.T.L. standard blue ; but if specially ordered, red, purple or black colouring can be supplied at same price. Other ranges, sizes or types to order. We solicit enquiries.

POCKET THERMOMETERS.

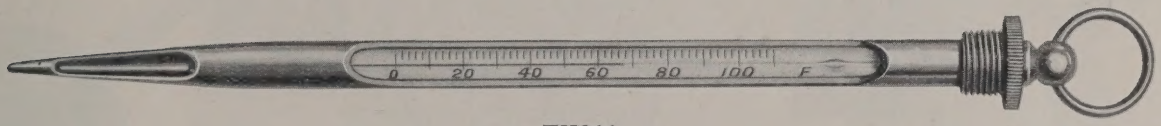
TH260



TH262



TH264



TH266

TH260 **Pocket Thermometer,** light model, for general use, in nickel-plated sliding case, 5 in. long closed, 9 in. long open ; mercury filled, graduations engraved on stem, best quality. Ranges, 0° to 100° F., 20° to 220° F., 0° to 100° C.

each *d* **4/6** ; per doz. *d* **£2 8 6**

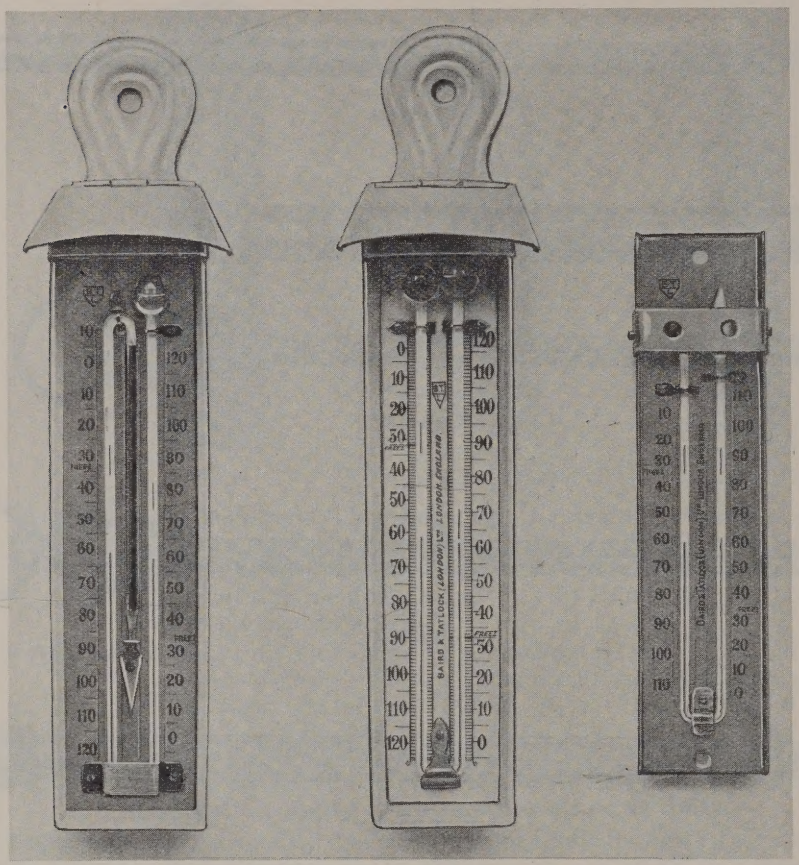
TH262 **Pocket Thermometer,** with heavy gauge brass screw-top case ; nickel-plated, fitted with clip and ring, mercury filled, graduations engraved on stem, best quality, 4½ in. long. Ranges as No. TH260 .... each *d* **13/-** ; per doz. *d* **£7 0 0**

TH264 **Pocket Thermometer,** as above, without clip, 5½ in. long ,, *d* **16/6** ,, *d* **£8 18 0**

TH266 **Pocket Thermometer,** with heavy gauge brass case, screw top ; nickel-plated, fitted with ring. The bulb is tapered and fitted into a specially tapered pocket as illustrated ; mercury filled, best quality, 7 in. long. A very useful pattern for meat inspectors, warehousemen, produce buyers, etc. Ranges as No. TH260 each *d* **17/6** ; per doz. *d* **£9 9 0**

Other ranges supplied to order. Special prices for quantities.

MAXIMUM AND MINIMUM THERMOMETERS.

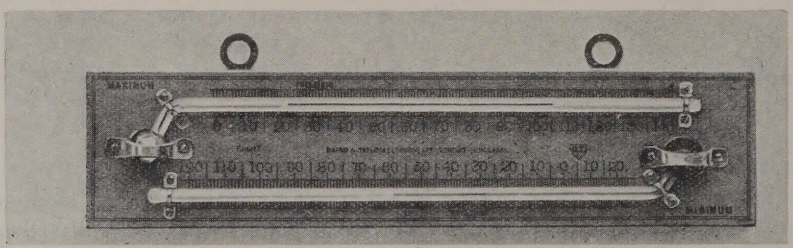


TH270 TH272 TH274

TH270 **Thermometers, Six's** maximum and minimum, with 10 in. zinc scale, in white japanned frame, with magnet .... each *b* **£0 11 0**

TH272 **Thermometers, Six's** 10 in., with opal glass scale, in white japanned case with magnet, round bulb pattern .... each *b* **£0 15 0**

TH274 **Thermometers, Six's** maximum and minimum, 9 in. overall, mounted on graduated zinc frame, complete with magnet .... each *b* **£0 8 6**



TH276

TH276 **Thermometers,** maximum and minimum, horizontal pattern, on polished boxwood back, with eyes for affixing to wall .... each *b* **£0 15 0**

DIAL THERMOMETERS.

DIAL pattern thermometers can be adapted for use with all General Industrial Plants, and on Tanks, Pipes, Pressure Vessels, etc.

Special Features.—Specially designed in straight and angle form to give an open scale, and bold mercurial column to facilitate reading from a distance. Stout cast frame, steel protecting stem. Fixing boss may be screwed $\frac{1}{2}$ in., $\frac{3}{4}$ in. or 1 in. gas (B.S. pipe thread). **Stem can be had of any length from 2 in. to 4 ft., measuring from hexagonal nut attached to frame, and be made from steel, brass, copper or monel metal to resist corrosion of acids and alkalies,** etc. **All usual ranges,** *e.g.* 30° to 220° F., 50° to 300° F., 60° to 400° F., etc.; also, if preferred, Centigrade scales, or combined C. and F. scales, can be supplied.

All brass parts lacquered.

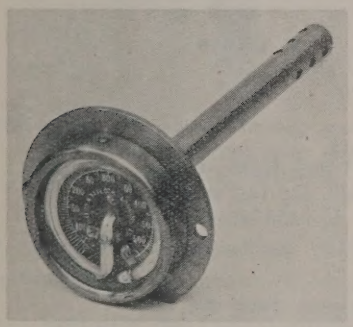
The dial is totally enclosed, ensuring adequate protection against the corrosive influence of gases and liquids.

All are of our usual " guaranteed accurate " standard.

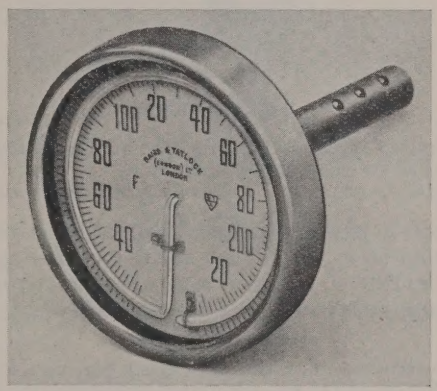
Fittings and attachments for fixing these thermometers in tanks or vessels supplied on receipt of particulars.

Dial Thermometers can now be supplied fitted with borosilicate tubes, for use at high temperatures. Prices on application.

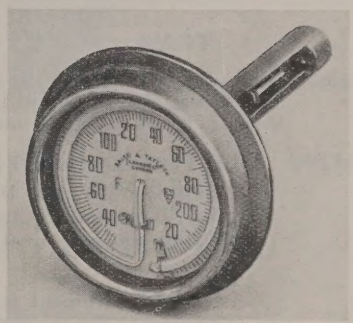
Please state exact requirements as to thread and length of stem.



TH280



TH282-TH286



TH288

Note.—Stems can be screwed with any required thread up to 1 in. B.S. at the quoted price. Extra lengths of *steel* stem supplied at an extra cost of 4/6 per ft.

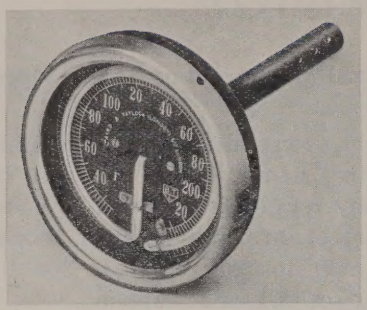
TH280 **Dial Thermometers,** Admiralty pattern, provided with frame $3\frac{5}{16}$ in. diam., black and white metal or opal glass scale, figured in red, white or black, range 65° to 530° F. For use in ships' ovens. With tail up to 6 in. long .... each *d* **£1 15 6**

TH282 **Dial Thermometers,** horizontal pattern, with cast-iron frame 6 in. diam., aluminium bezel, black and white metal or opal glass scale, figured in red, white or black, range 30° to 100° F., 30° to 220° F., 50° to 300° F., 60° to 400° F. With tail up to 6 in. long, screwed up to 1 in. thread as required .... each *d* **£3 10 0**

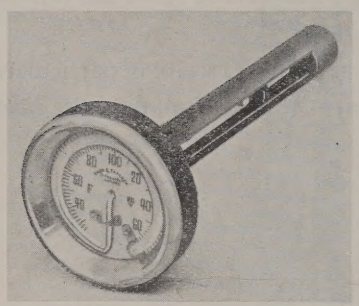
TH284 **Dial Thermometers,** horizontal pattern, as above, but with cast-iron frame 4 in. diam. .... each *d* **£2 10 0**

TH286 **Dial Thermometers,** horizontal pattern, as above, but with cast-iron frame 3 in. diam. .... each *d* **£1 10 0**

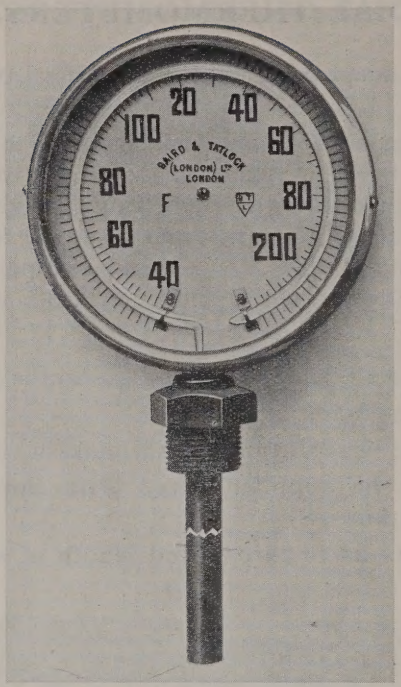
TH288 **Dial Thermometers,** horizontal pattern, same specification as TH282, but with cast-iron frame 4 in. diam. and **brass** bezel .... each *d* **£2 0 0**



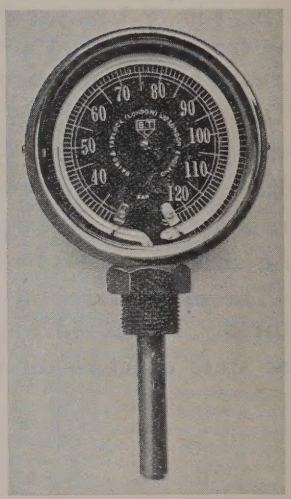
TH290



TH294



TH296-TH298



TH300

Note.—Stems can be screwed with any required thread up to 1 in. B.S. at the quoted price.
Extra lengths of *steel* stem supplied at an extra cost of 4/6 per ft.
Stems of brass, copper or monel metal, to resist the corrosive action of acids and alkalies, quoted on receipt of particulars.

TH290 **Dial Thermometers,** horizontal pattern, **interchangeable,** strong cast-iron frame $4\frac{3}{4}$ in. diam., with steel protecting stem, black and white metal or opal scale, figured in red, white or black, range 30° to 220° F., divided every 2° or as required. Aluminium bezel. With stem up to 6 in. long, **screwed for 1 in. gas only** .... each *d* **£2 2 0**

DESCRIPTION

This instrument is so constructed that the graduated dial and glass mercury tube can be removed—for renewal or change of range—without dismantling the thermometer casing, thus saving the usual delay which occurs in case of breakage. The process of changing is accomplished very easily; all that is required is to take off the aluminium bezel by removing the two side screws, the dial and glass, with protecting stem, being then screwed out by means of the two small holes near the dial centre.

TH292 **Spare Thermometer Tube and Dial** for above .... ,, *d* **£0 18 0**

TH294 **Dial Thermometers,** horizontal, with **cast gun-metal frame** $3\frac{1}{2}$ in. diam., black and white metal or opal scale, figured in red, white or black, range 30° to 150° F., divided every 2°, with tail up to 6 in. long as required .... each *d* **£2 3 6**

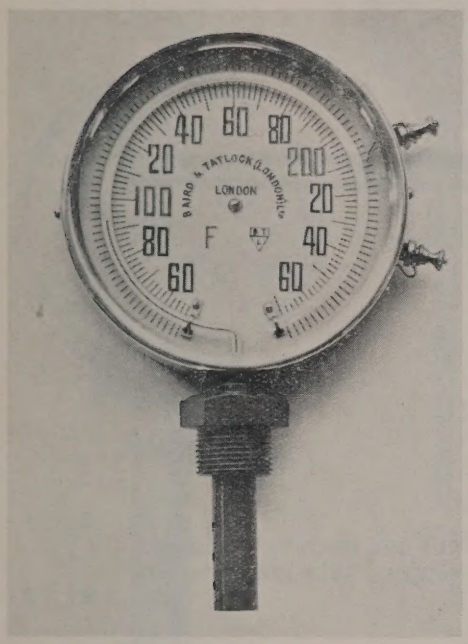
TH296 **Dial Thermometers,** vertical pattern, with cast-iron frame 6 in. diam. and aluminium bezel, black and white metal or opal scale, figured in red, white or black, range 30° to 100° F., 30° to 220° F., 50° to 300° F., 60° to 400° F. With tail up to 6 in. long, screwed up to 1 in. B.S. thread as required .... each *d* **£3 15 0**

TH298 **Dial Thermometers,** vertical pattern, as above, but with cast-iron frame 4 in. diam. each *d* **£2 15 0**

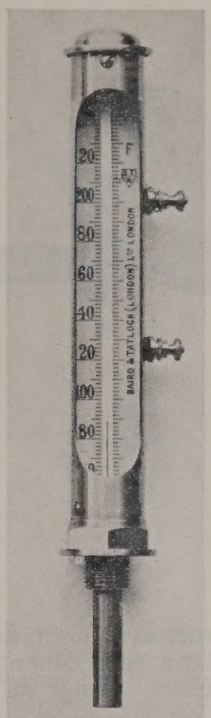
TH300 **Dial Thermometers,** vertical pattern, as TH298, but with **light lacquered brass frame,** 4 in. diam. .... each *d* **£2 0 0**

Note.—Although the various Dial Thermometers are shown in the illustrations fitted with a particular type of tail or dial, this is merely done in order to show the different patterns which can be supplied. **When ordering please state type of dial preferred, also whether the tail is required :** (*a*) Slotted, open end as illustration TH288; (*b*) perforated, open end as illustration TH282-TH286; (*c*) completely closed, as illustration TH296-TH298.

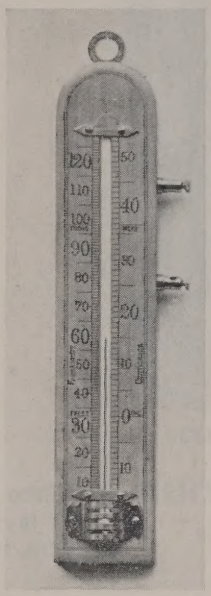
ELECTRIC ALARM THERMOMETERS.



Dial Thermometer with Electric Contacts



Pipe Thermometer with Electric Contacts



ETH310

Used in conjunction with a battery of low voltage to give warning at a predetermined temperature by means of ringing a bell.

Suitable for Cold Stores, Grain Elevators, Malt Houses, Hospital Disinfection Chambers, Incubators, Drying Rooms, and for any purpose where a check on temperature is desirable.

The points of contact, which **are not adjustable**, are formed by fixing platinum wire in the bore of the glass tubing at the temperature required. Another platinum wire is fused into the glass and is in permanent contact with the mercury. When the signal temperature has been reached contact is made between the mercury and the platinum wire in the bore.

All terminals are insulated from the metal case and the glass tube hermetically sealed.

Prices.—Any dial thermometer listed can be supplied as an electrical thermometer for an additional charge of .... *d* **£0 15 0**

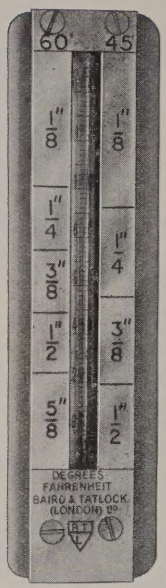
Any pipe or angle thermometer listed can be supplied as an electrical thermometer for an additional charge of .... *d* **£1 1 0**

Note.—When ordering electrical contact thermometers, please prefix the catalogue number of the required type, with the letter E—*e.g.* Dial Thermometer TH280 with electrical contacts becomes ETH280 and so on.

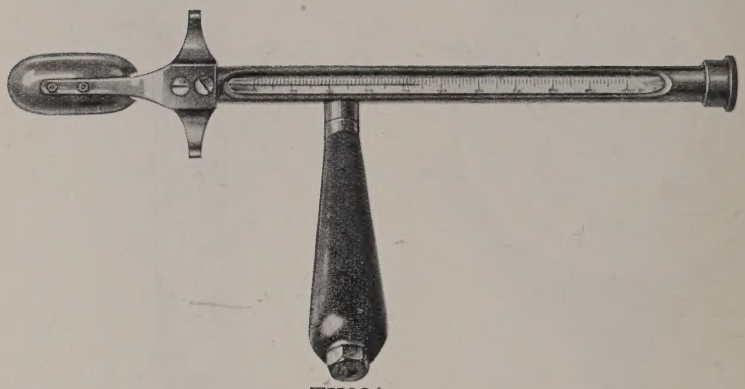
State the temperature at which the alarm is to be given.

ETH310 Electric Boxwood Wall Thermometers, with bevelled edges, Fahrenheit and Centigrade scale, range 30° to 120° F. and 0° to 50° C. as figured above .... each *d* **£0 10 6**

SURFACE THERMOMETERS.



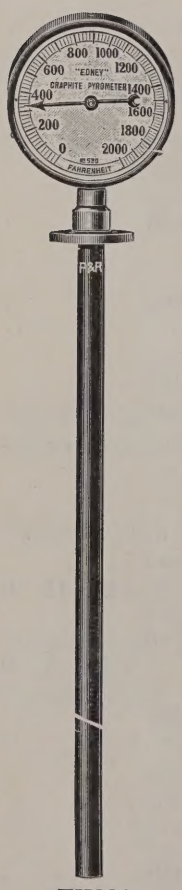
TH320



TH324

TH320 **Surface Thermometers,** for railway engineer's use, specially graduated for laying standard rails. Mount of solid copper ; tube graduated on stem, mercury filled. Range 20° to 140° F. .... each *d* **£1 2 6**

Surface Thermometers. The bulb is reduced to the smallest dimension possible with a mercury-in-glass thermometer in order to reduce the thermal lag to a minimum. On to the glass bulb a copper foot is soldered with a special alloy ; this foot offers a comparatively large surface and forms a good conduction of heat to the bulb. Surrounding the bulb and copper foot is a reflector, polished inside and outside to prevent loss of heat by radiation or by air currents ; the reflector is sprung from the glass tube to ensure the copper foot being in good contact with the surface. This thermometer was designed for occasional use to determine the temperature of hot surfaces for scientific and industrial purposes.



TH326

TH322 **Surface Thermometer,** mercury filled, lens tube, complete in wooden box. Range 0° to 100° Centigrade divided every 1°, or equivalent Fahrenheit .... *f* **£4 10 0**

TH323 **Ditto.** Range 50° to 200° Centigrade .... *f* **£4 12 6**

TH324 **Ditto,** in brass case with handle, complete in wooden box. Range 0° to 100° Centigrade or corresponding Fahrenheit .... *f* **£6 15 0**

TH325 **Ditto.** Range 50° to 200° Centigrade .... *f* **£6 17 6**

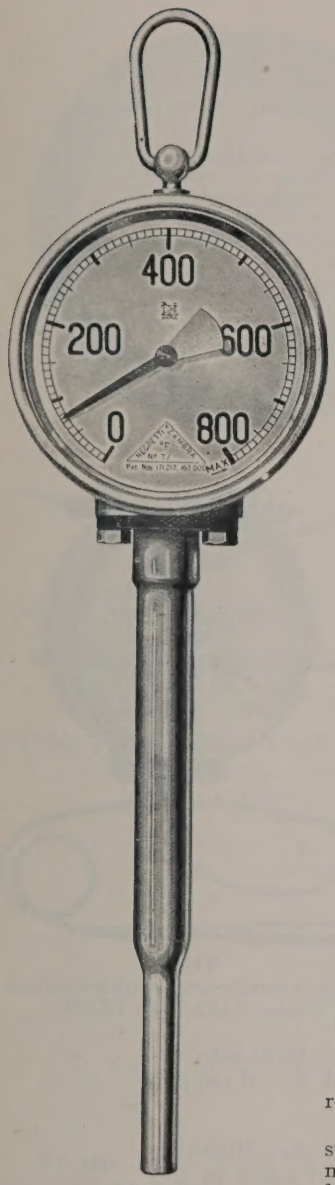
HIGH RANGE THERMOMETER.

(INDUSTRIAL PYROMETER.)

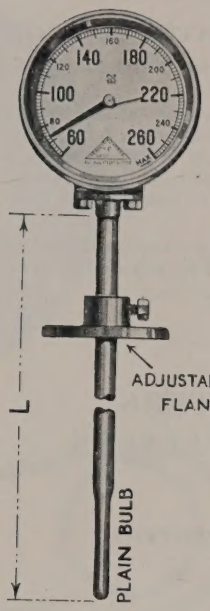
TH326 **Graphite Pyrometer,** expansion principle, exceptionally robust design for industrial use, heavy metal case, steel sheath to stem, dial 6 in. diameter. Standard stems, 24 in., 36 in., 48 in. ; other lengths to order. Temperature range, up to a maximum of 2000° F. (1093° C.). Please specify range required (with order) and length of stem .... *d* **£8 0 0**

PORTABLE AND FIXED STEM DIAL THERMOMETERS.

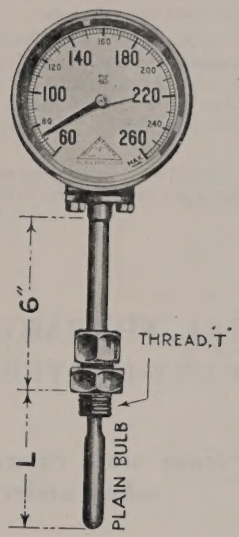
MERCURY-IN-STEEL PATTERN.



TH330



TH332



TH334

TH330 4 in. Portable Dial Thermometer, very suitable for occasional use in tanks, etc. They are very sensitive and accurate in their readings, and can be used for a variety of purposes. They are very robust and easily read. The cases are die-cast, with screwed-on bezel, nickel-plated, and are reasonably moisture proof. The dials are white, with black graduations and figures. Aperture of bezel, 3½ in. Length of scale, 8 in.

Standard Ranges.		A. 16 in stem. Price.	B. 36 in. stem. Price.	C. 60 in. stem. Price.
Fahrenheit.	Centigrade.			
0° to 160°	−20° to 80°			
60° ,, 260°	0° ,, 120°	ƒ£7 0 0	ƒ£7 10 0	ƒ£8 5 0
50° ,, 450°	0° ,, 200°			
0° ,, 1000°	0° ,, 550°			

Extra for wooden handle at top .... ƒ£0 5 6

Other ranges to order.

FIXED STEM TYPES.

The **Fixed Stem Type of Mercury-in-Steel Dial Thermometer** is usually made to requirements as to range, length of stem, etc.

In the installation of these instruments it is important that the indicator should not be subject to excessive temperatures by conduction or radiation, or be placed where fumes or moisture may enter the case. The instrument is made reasonably moisture and fume proof, but where there is doubt as to the conditions it is advised that the instrument should be of the Capillary Type, so that the indicator may be placed in a more favourable position.

The instrument must be ranged to cover the maximum temperature met with under extreme conditions, **and state range required when ordering.**

	Aperture of Bezel.		Length "L" up to	Extra per foot.
	4 in. Price.	6 in. Price.		
TH332 as illustrated	ƒ£8 10 0	ƒ£11 0 0	3 ft.	ƒ£0 10 0
TH334 ,,	ƒ£8 10 0	ƒ£11 0 0	1 ,,	ƒ£0 10 0
TH336†	ƒ£9 5 0	ƒ£11 15 0	1 ,,	ƒ£1 0 0

† Not illustrated. With bulb, adapter and pocket.

The bulbs and stems are usually coppered up to a temperature of 400° F. (205° C.) and the pockets are of brass. Above this temperature they are of mild steel.

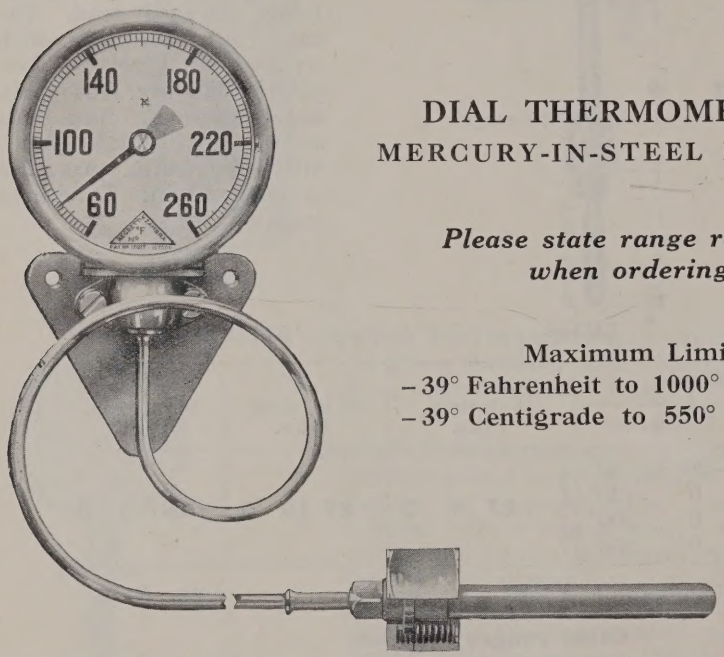
PATENT MERCURY-IN-STEEL INDICATING AND RECORDING THERMOMETERS.

DIRECT ACTION IN COMPENSATED TUBING.

These patented mercury-in-steel thermometers have a direct action movement and compensated capillary tubing; they give reliable readings and satisfactory service over long periods.

The object of the direct action is to eliminate all gears, levers and hair springs, which cause friction and, consequently, inaccuracy, in addition to being a source of weakness; the end of the Bourdon tube is attached direct to the hair spring carrying the centre spindle or pen arm. The object of the compensated capillary tubing is that, if not compensated, the tubing when heated acts like a thermometer owing to the liquid inside expanding; therefore any variation in the air temperature causes an error in the reading of the instrument. In this type of thermometer such an error is entirely eliminated.

Inaccuracies due to calibration, hysteresis, ageing, etc. have been carefully investigated and practically eliminated. These instruments are guaranteed accurate within $\frac{1}{2}$ per cent. of the range and for a period of two years.

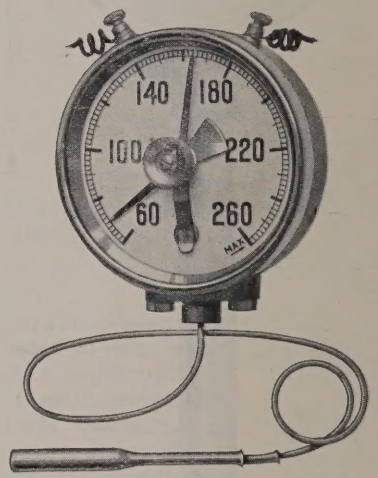


TH340 Dial Thermometer with Bulb and Adapter TT/203

DIAL THERMOMETERS.
MERCURY-IN-STEEL PATTERN.

Please state range required when ordering.

Maximum Limit:
–39° Fahrenheit to 1000° Fahrenheit.
–39° Centigrade to 550° Centigrade.



TH342
Dial Thermometer with Electrical Contacts and Bulb TT/200

TH340 **4 in. Dial Thermometer,** range as required, movement mounted in a fume-tight die-cast case, nickel-plated bezel, black figuring on white dial, complete with 10 feet of copper capillary and any type of bulb fitting as shown on page 653.

TH342 **Ditto,** but fitted with an **adjustable electric contact.** This consists of an adjustable index hand wired to an insulated terminal and operated by a knurled knob in the centre of the dial. At the end of the index hand a gold-silver wire makes contact with the pointer, which is earthed to the case and to a second terminal.

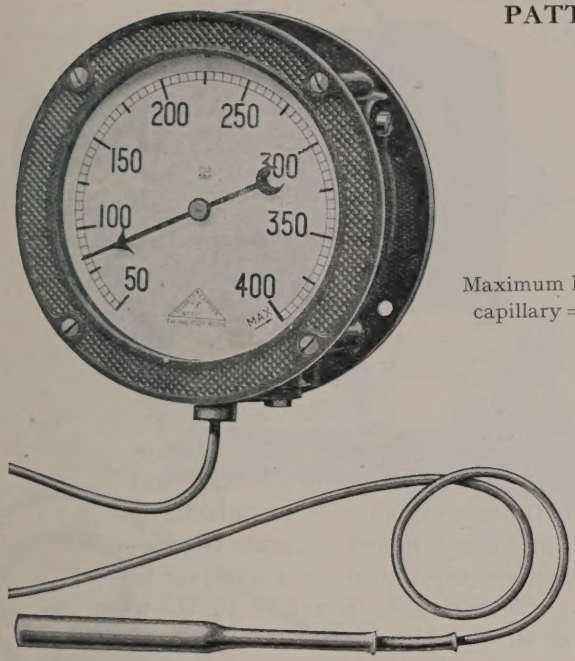
Type of Bulb Fitting as page 653.	TH340. Price.	TH342. Price.
TT/200	£7 10 0	£9 15 0
TT/202	£8 15 0	£11 0 0
TT/203	£8 10 0	£10 5 0
TT/206	£9 10 0	£11 5 0
TT/210	£9 10 0	£11 5 0

Extra capillary beyond 10 feet (up to 20 feet only) .... per foot £0 4 0

The 4 in. Dial Thermometer, TH340, can also be supplied in a cast-iron case with $5\frac{1}{4}$ in. diameter flange at the back of the case .... extra £2 0 0

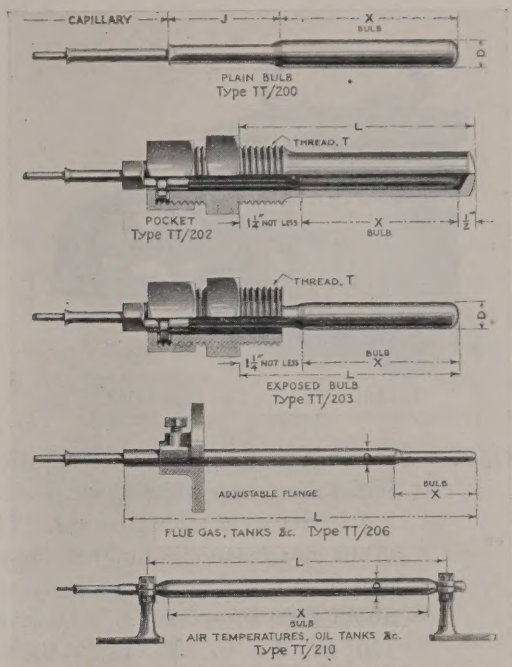
6 in. and 9 in. DIAL THERMOMETERS.

MERCURY-IN-STEEL PATTERN.



Maximum length of capillary = 100 ft.

TH350–TH352 With Bulb TT/200



Types of Bulb Fittings

TH350–TH352 Dial Thermometer, range as required } movement mounted in a fume-tight, cast-iron case, enamelled grey, black figuring on white dial, complete with 10 feet of copper capillary and any type of bulb fitting as above.

Type of Bulb Fitting as illustrated.	TH350 6 in. Price.	TH352 9 in. Price.
TT/200	ƒ £11 14 0	ƒ £14 17 0
TT/202	ƒ £12 19 0	ƒ £16 2 0
TT/203	ƒ £12 4 0	ƒ £15 7 0
TT/206	ƒ £13 4 0	ƒ £16 7 0
TT/210	ƒ £13 4 0	ƒ £16 7 0

State range required when ordering

Extra capillary beyond 10 feet .... per ft. ƒ £0 4 0

NOTES ON BULB FITTINGS.

For Dial Thermometers and Recorders.

TT/200.—This type of bulb fitting is usually of steel and is inserted in a pocket already installed on the plant. Where, however, it is to be immersed in a tank together with part of the capillary, the bulb stem is constructed of copper and the steel bulb is heavily copper-plated to prevent corrosion. TT/200 prices include dimensions " J " and " X " up to 12 in. only.

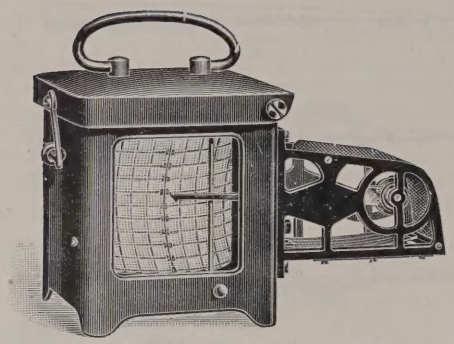
TT/202.—Pockets should be ordered wherever possible. They are necessary when it is desired to remove the thermometer without shutting down the plant, or when additional protection for the bulb is necessary. The bulb of the thermometer should be a sliding fit in the pocket unless the pocket is mercury filled. On no account should mercury be used in brass pockets. The pockets may be made of stainless steel, monel metal, etc. at additional cost. The pockets are usually screwed ¾ in. or 1 in. gas thread, with length " L " 6 in. TT/202 prices include length " L " up to 10 in. only.

TT/203.—This type of bulb fitting gives full exposure to the bulb and is that supplied when specially sensitive readings are required. The thread is usually ¾ in. or 1 in. gas, and length " L " 6 in. Where these bulb fittings are used in water they are made of brass and the bulb is heavily coated with copper to prevent corrosion. TT/203 prices include length " L " up to 12 in. only.

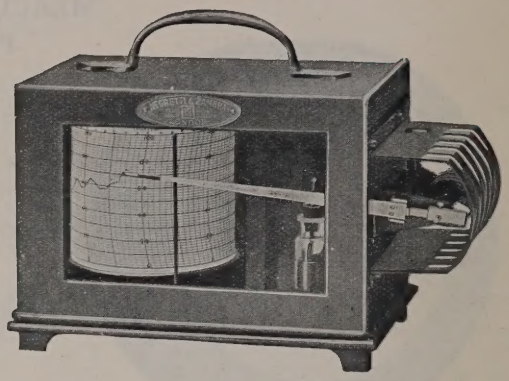
TT/206.—This type of bulb fitting is usually supplied for flue gases or for open tanks. For flue gases, the bulb and stem are made of steel and the adjustable flange of cast-iron. These bulb fittings may be made in copper or brass where the steel is liable to be corroded. TT/206 prices include length " L " up to 4 ft. only.

TT/210.—This type of bulb fitting is generally supplied for air temperatures, oil temperatures in tanks, etc. The bulb is of steel, coppered or lead coated. The brackets are of cast-iron or brass. The dimension " L " is usually about 18 in., depending on the range, etc.

BIMETALLIC TEMPERATURE RECORDERS.



TH360 Patent No. 185965/22



TH362

TH360 **The Thermograph** illustrated above is the result of experiments made with a form of bimetallic strip which has given very satisfactory results in respect of accuracy and sensitivity over a long period. The design enables the instrument to be manufactured in an inexpensive manner in large quantities and provides a robust, accurate thermograph suitable for all purposes where temperatures are required to be known up to about 250° F. or 120° C. Daily **or** weekly clock. Stock ranges: 0° to 100° F., 10° to 110° F., 30° to 130° F., −10° to 90° F., −15° to 40° C., 0° to 55° C. Price with 55 charts and ink .... *e* **£7 10 0**

TH361 **Charts** for TH360 .... per 100 *e* **£0 11 0**

TH362 **Temperature Recorder, 3 in. Bimetallic** used extensively in cold-storage plants, factories, mines, heating and ventilating systems, etc., for recording the air temperature conditions on a chart. Also used in ships' holds when enclosed in a ventilated crate and stowed with the cargo for the purpose of obtaining a record of the temperature during a voyage. The chart measures 3·6 in. × 11·2 in., with the height of the temperature scale 3 in. Standard ranges: 0° to 100° F., 30° to 130° F., 50° to 150° F., −10° to 45° C., 0° to 55° C., 10° to 65° C. Daily **or** weekly clock, complete with 100 charts and ink .... *d* **£7 0 0**

TH363 **Ventilated Crate,** with padlock and key .... *d* **£1 15 0**

TH364 **Charts** for TH362 .... per 100 *d* **£0 12 0**

TH366 **Temperature Recorder, 5½ in. Circular Chart Bimetallic,** consists of a bimetallic coil to which is attached a pen arm operating on a paper disc chart 5½ in. diameter. The temperature scale measures 2 in.; the case is of cast-aluminium enamelled and stoved grey, and is fitted with a lug for panel fixing. Range, 0° to 100° F. or −10° to 40° C. Daily **or** weekly clock, complete with 100 charts and ink .... *f* **£8 0 0**

TH367 **Ditto**, with 30-day clock .... *f* **£9 10 0**

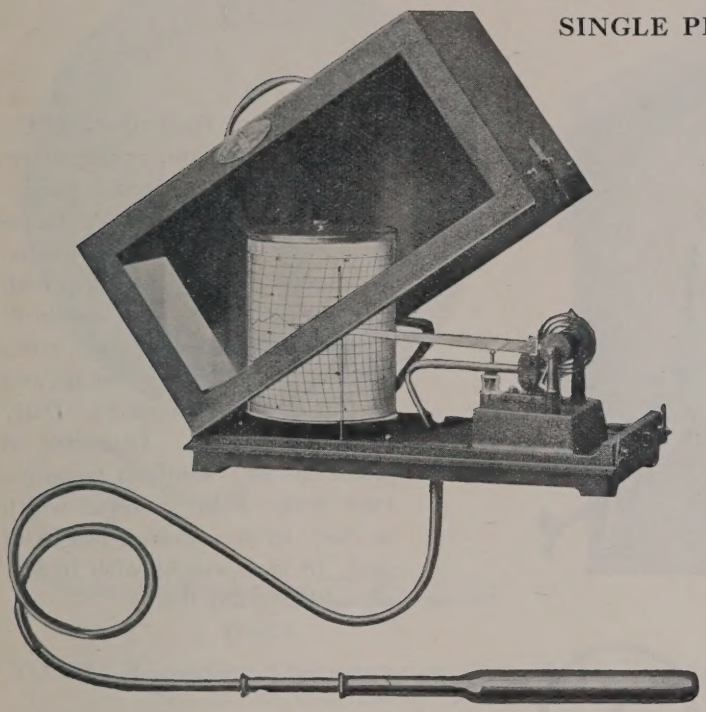
TH368 **Charts** for TH366 or TH367 .... per 100 *f* **£0 15 0**

TH369 **Wooden Crate** for TH366 or TH367 recorder when it is required to place it in ship's hold with cargo for obtaining record during voyage. Substantial construction, well ventilated, fitted with padlock and key .... *f* **£1 5 0**

TEMPERATURE RECORDERS. MERCURY-IN-STEEL.

VERTICAL DRUM TYPES.

SINGLE PEN.



TH370–TH372 Temperature Recorders, Single Pen, range as required, movement mounted on a cast-iron base with hinged sheet-metal cover, glass panelled. Instrument crystalline black with lacquered brass fittings; complete with 100 charts, ink, and 10 feet of copper capillary. Daily **or** weekly clock.

TH370 Bulb Fitting TT/200, page 653.

Standard Ranges.

F.	F.	C.	C.
−40° to 120°	50° to 450°	−30° to 50°	0° to 200°
0° ,, 160°	50° ,, 550°	−10° ,, 70°	0° ,, 300°
50° ,, 250°	0° ,, 1000°	20° ,, 120°	50° ,, 550°

Dimensions.	TH370 (Small Size).	TH372 (Large Size).
Length of case	11·2 in.	14·5 in.
Depth of case	5·2 ,,	7·5 ,,
Height of case	6·0 ,,	8·5 ,,
Height of chart	3·6 ,,	5·8 ,,
Length of chart	11·8 ,,	16·2 ,,
Height of temperature scale	3·0 ,,	5·0 ,,
Weight with 10 feet of capillary	10 lbs.	23 lbs.

Type of Bulb Fitting as page 653.	TH370. Price with 10 feet of Capillary.	TH372. Price with 10 feet of Capillary.
TT/200	*f* £15 10 0	*f* £20 10 0
TT/202	*f* £16 15 0	*f* £21 15 0
TT/203	*f* £16 0 0	*f* £21 0 0
TT/206	*f* £17 0 0	*f* £22 0 0
TT/210	*f* £17 0 0	*f* £22 0 0

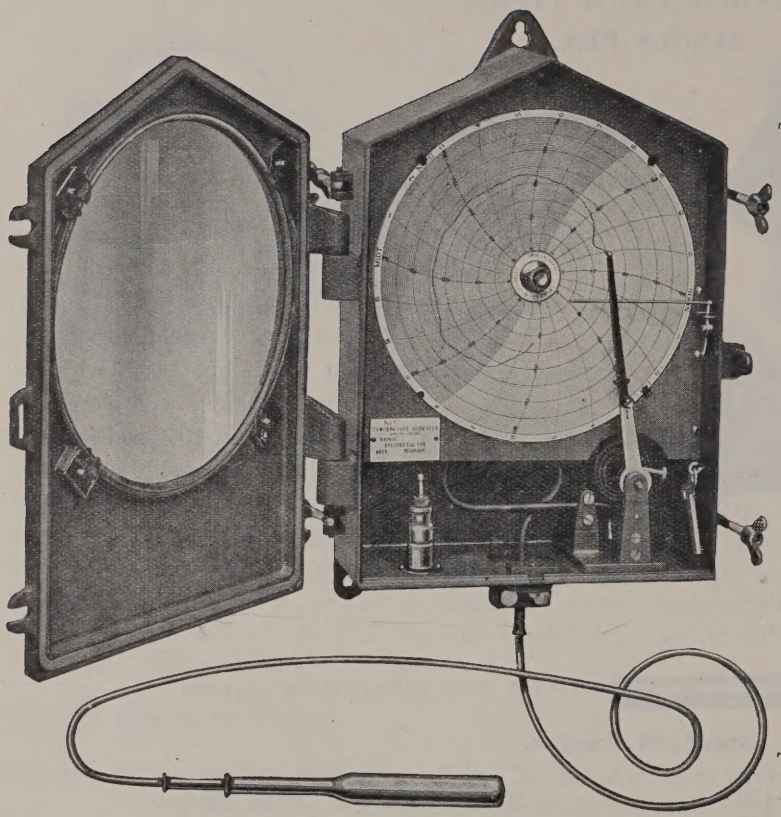
Extra capillary beyond 10 feet .... per ft. *f* £0 4 0

Prices for special types of Bulbs, Fittings or Protective Pockets upon request.

TH375 Charts .... (*a*) for TH370, per 100, *f* £0 12 0; (*b*) for TH372, per 100 *f* £0 15 0

CIRCULAR CHART TYPE.

SINGLE PEN.



TH376 **Temperature Recorder, C.C., Single Pen Type,** range as required, with 10 in. circular chart: movement mounted in a fume-tight, cast-iron case with hinged door, glass panelled and held with four wing nuts and padlock. Instrument enamelled grey; complete with 100 charts and ink and 10 feet of copper capillary. Daily **or** weekly clock. Diameter of chart, 10 in.; width of temperature scale, 4 in.; overall width of case, 13 in.; overall height of case, 18 in.; weight with 10 feet of capillary, 35½ lbs.

TH376 Bulb Fitting TT/200, page 653.

Standard Ranges.

F.	F.	C.	C.
−40° to 120°	50° to 550°	−30° to 50°	0° to 300°
0° ,, 160°	0° ,, 800°	−10° ,, 70°	0° ,, 400°
50° ,, 250°	0° ,, 1000°	20° ,, 120°	50° ,, 550°
50° ,, 450°		0° ,, 200°	

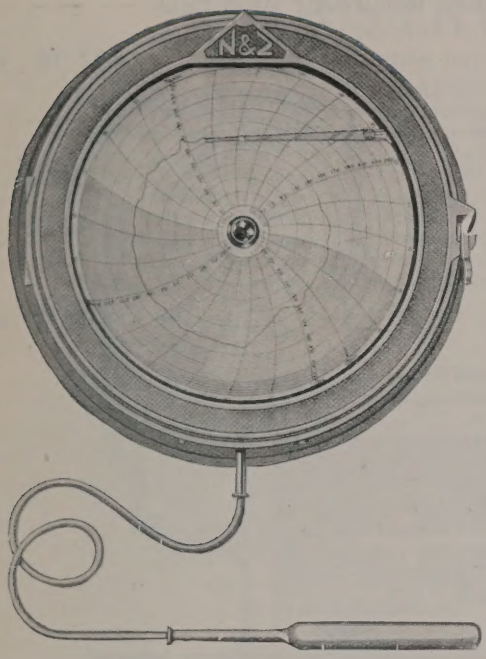
Type of Bulb Fitting as page 653.	Price with 10 ft. of Capillary.
TT/200	£22 10 0
TT/202	£23 15 0
TT/203	£23 0 0
TT/206	£24 0 0
TT/210	£24 0 0

Extra capillary beyond 10 feet .... per ft. £0 4 0

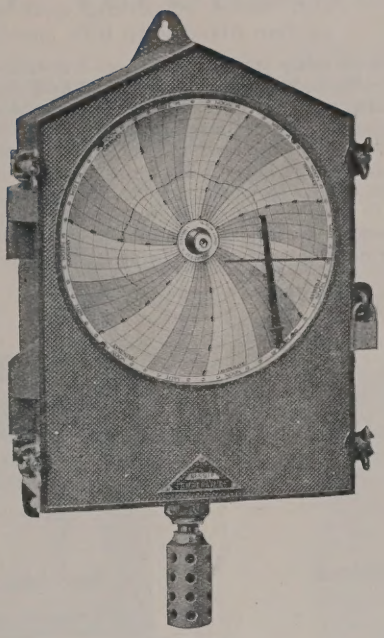
TH378 **Charts** .... per 100 £0 15 0

Note.—Recorders can be supplied with any range from −40° to 1000° F. (−40° to 550° C.). The minimum number of degrees on the chart should not be less than 100° F. (50° C.), and the maximum reading should be 10 per cent. in excess of the extremes of temperature likely to be met with under working conditions. It is advisable, when possible, to start the scale at normal air temperature.

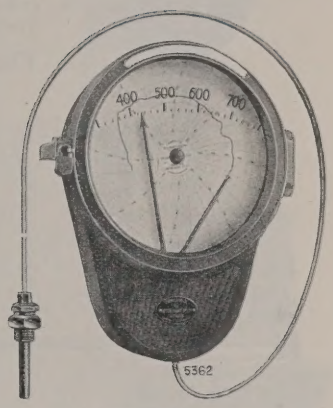
The standard charts are ruled with 50 and 80 divisions for the temperature scale and rotate once per day or once per week, with suitable time scales. When special ranges are required, the standard charts are overprinted with the temperature figuring. When special ranges are chosen, they should be suitable for the above ruling—*i.e.* one division on the chart should represent either 1, 2, 5 or 10 degrees. Any of these charts are supplied without additional cost. Charts with special rulings can be supplied at the additional cost of establishing copper plates.



TH380



TH384



TH386b

TH380 **Recording Thermometer, New Model Mercury-in-Steel Type,** similar in construction to the instruments described on page 656 but with movement mounted in a circular cast-iron moisture-proof case enamelled and stoved grey; flanged for wall attachment. The instrument is complete with 100 charts and ink and 10 feet of copper capillary tubing, Daily **or** weekly clock. Range as required between −40° and 1000° F. (−40° and 550° C.). Charts, 10 in. diameter; case, 13 in. diameter; weight with 10 feet of capillary, 20 lbs.

Type of Bulb Fitting as page 653.	Price with 10 ft. of Capillary.
TT/200	£12 10 0
TT/202	£13 15 0
TT/203	£13 0 0
TT/206	£14 0 0
TT/210	£14 0 0

Extra capillary beyond 10 feet .... per ft. £0 4 0

TH382 **Charts,** standard ranges .... per 100 £0 15 0

TH384 **Temperature Recorder, 10 in. C.C.,** suitable for wall or panel fixing, mercury-in-steel type, circular chart 10 in. diameter, movement mounted in a cast-iron case enamelled and stoved grey, with nickel-plated fittings, complete with 100 charts and ink. Daily **or** weekly clock. Range: 10° to 110° F., 0° to 160° F., −10° to 40° C., −10° to 70° C. .... each £21 0 0

TH385 **Charts** for TH384 .... per 100 £0 15 0

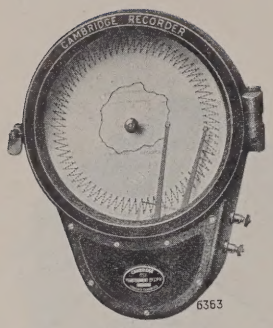
TH386 **Indicating and Recording Thermometer, Combined Type.** With 100 charts, ink and filler, and plain bulb for air temperatures £13 0 0

It is sometimes a convenience to be able to read the temperature registered by a recording instrument from a distance without going to the expense of a separate indicating instrument. This instrument comprises a standard type of recording thermometer of the mercury-in-steel pattern fitted with a separate pointer and a clear scale.

TH386a **Ditto,** with 6 ft. capillary tubing and plain bulb £14 10 0

TH386b **Ditto,** with 6 ft. capillary tubing, plain bulb, connection screwed $\frac{3}{4}$ in. or 1 in. gas thread, any length up to 12 in. below flange, any standard range chart £15 2 0

TH387 **Charts** for TH386, TH386A, TH386B .... per 100 £0 7 6

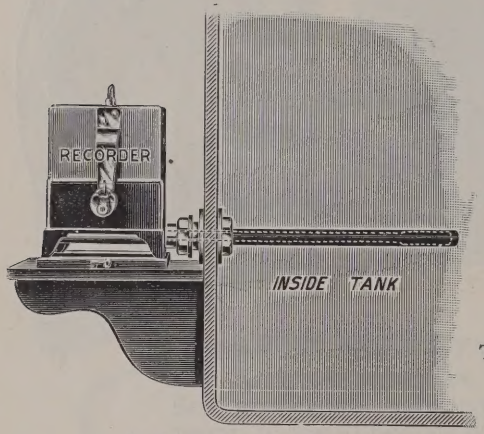


TH389

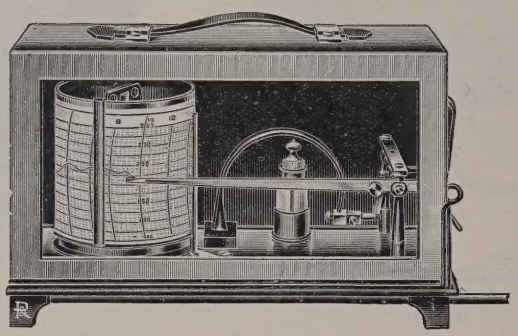
TH389 Combined Time and Temperature Recorder. With inks and fillers, recording counter for 4-volt supply, temperature system fitted with 6 ft. capillary and plain bulb .... *f* **£22 10 0**

There are many applications where it is desirable to obtain records of the frequency of certain mechanical operations, associated with the temperature of a process. This instrument is fitted with two independent pens, one of which records the temperature while the other is operated electro-magnetically by the mechanical movement which it is desired to record. The time-recording pen records not only the time, but also the frequency, duration and the periods during which the machine has been idle ; the records thus serve as a check on the regularity of working and the process time. The time pen is usually arranged to record in a series of grouped steps, each step indicating an operation, and each group being five operations, thus facilitating the counting when the operations are frequent. The electro-magnet can usually be operated from a 4-volt supply.

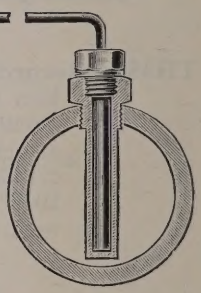
TH390 Charts .... per 100 *f* **£0 7 6**



TH392



TH394



Self-recording Distance Thermometers. These instruments are specially made for taking a record of the temperatures during any special manufacturing process, such as that in stills, hot liquor tanks, steam or hot air pipes, refrigerator chambers, chocolate cooling rooms, malt houses, etc. The instruments can be made to record any range, such as −10° to 40° F., 0° to 60° F., 0° to 120° F., 30° to 150° F., 100° to 250° F., 100° to 500° F. or corresponding Centigrade ranges. Other ranges may be supplied to suit customers' requirements. The clock drums revolve either in one **or** seven days, whichever is best for the purpose. The bulb can be any distance from the recorder from 6 in. to 50 ft., and the steel capillary tube between the bulb and the recorder is specially compensated against any changes of temperature in the surrounding atmosphere.

TH392 This pattern has a short stem and is for use in tanks, stills, malt houses, etc. The bulb is protected by a light steel or copper tube guard, which is bolted to the tank, and the steel bulb fits into it. Price of instrument complete with either one **or** seven-day clock drum, 50 charts, and ink and guard tube up to 18 in. .... *e* **£12 0 0**

Extra for stems and guard over 18 in., per 6 in. .... *e* **£0 5 0**

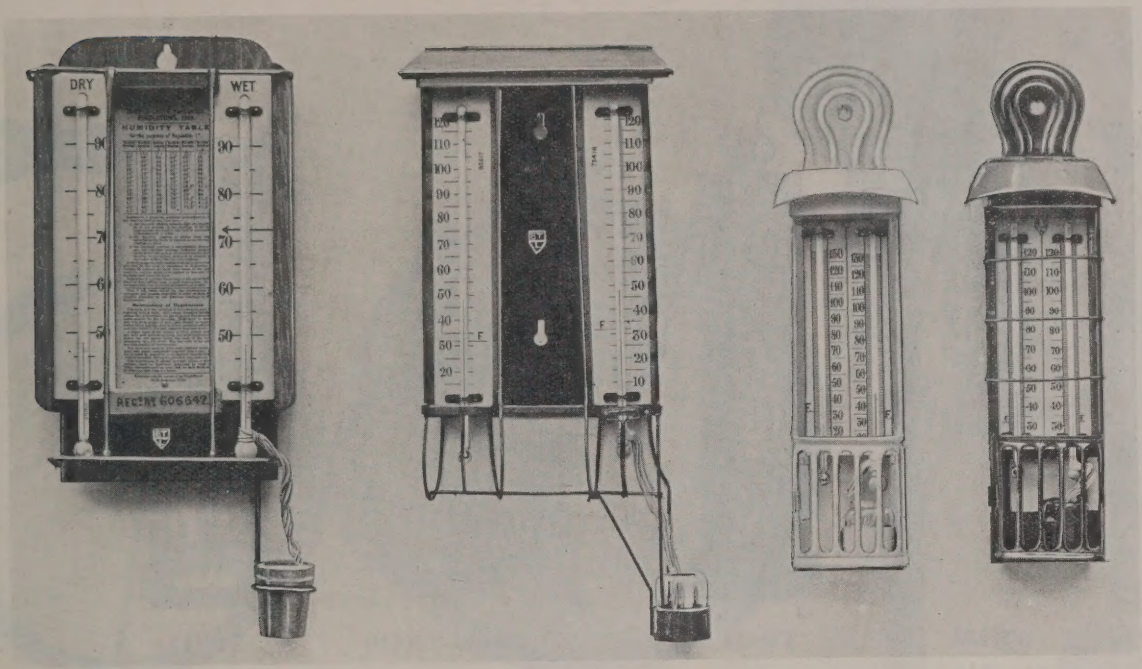
TH394 This pattern is specially made for distance recording. The capillary tube can be of any length from 1 to 50 ft., and is specially compensated for temperature changes in the surrounding air. The bulb can be made to fit in a mercury cup, as illustration, or fitted with an adjustable flange allowing it to be inserted to any depth in the boiler or still. If required the bulb and capillary tube can be covered with lead or copper to prevent corrosion. Price complete with clock drum revolving in either one **or** seven days, 50 charts, and ink and 6 ft. capillary tube .... *e* **£12 12 0**

Extra capillary tube over 6 ft., per ft. .... *e* **£0 4 6**

TH396 These instruments can also be fitted with two bulbs and stems which can be placed in different positions, and the temperature of both can be recorded on the same chart. This arrangement saves the cost of having two separate recorders. The two stems need not be the same length. Price complete with charts and two different coloured inks, and 6 ft. capillary tube to each bulb .... *e* **£18 18 0**

Extra capillary tube for both bulbs over 6 ft., per ft. .... *e* **£0 9 0**

INDUSTRIAL HYGROMETERS



TH410 TH414-TH416 TH418-TH420 TH426-TH428

Standard Pattern Hygrometers, for use in Cotton Factories, etc.

THESE hygrometers were devised by us to comply with the Home Office Regulations for use in cotton factories, and are the pattern adopted by the Blackburn and District Cotton Employers' Association, and made by us to their order.

The scales are of strong porcelain, with figures and divisions burnt in, and are extremely legible at a distance. They also have the advantage of being always easily cleaned. The thermometer bulbs are of normal glass, and tubes are accurately divided in ½° F. The oak frames are designed so that the thermometers can be readily taken out at any time, and are made with strips of wood at back to keep the frame away from the wall. They comply in every respect with the Home Office Regulations. Between the two thermometers an enamelled zinc plate is fixed, with the table of humidity and a copy of the Regulations as to artificial humidity, as provided by the Home Office Regulations of April-May 1929, printed thereon.

The brass wire guard is strongly made, and is hinged at top so that easy access can be had to the wet bulb for the weekly changing of the muslin wick.

TH410 **Hygrometers complete as figured,** with National Physical Laboratory Certificate for each thermometer .... *b* **£2 3 6**

TH412 **Thermometers, spare,** with N.P.L. Certificates, for above.

	Wet bulb.	Dry bulb.
Price	*b* **14/-**	*b* **13/6**

Mason's Hygrometers, ranged 20° to 120° F., for general use or for coal mines, or 20° to 130° F. with safety chamber, for tropics. Porcelain scales, tubes divided on stem in 1°.

TH414 Japanned case .... *b* **£1 12 0**

TH416 Copper case .... *b* **£1 16 0**

Mason's Hygrometers, with scales of porcelain, painted and fired.

TH418 Japanned case .... each *b* **£0 16 6**

TH420 Copper case .... ,, *b* **£1 1 0**

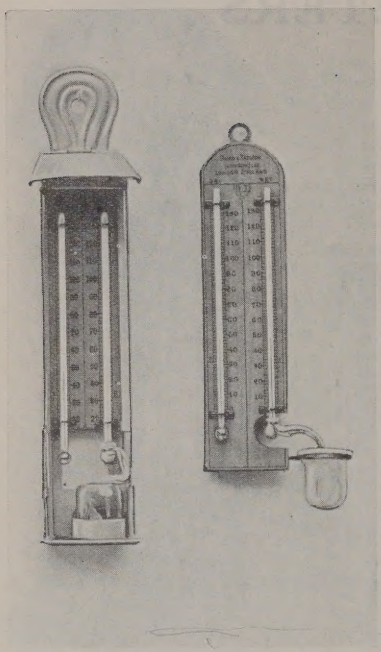
TH422 **Mason's Hygrometers,** japanned case, with boxwood scale .... ,, *b* **£0 12 0**

TH424 **Mason's Hygrometers,** japanned case, with polished zinc scale .... ,, *b* **£0 12 6**

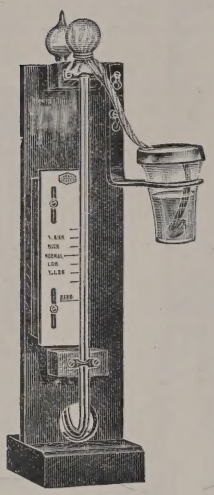
Mason's Hygrometers, as TH418–TH420, fitted with wire guards to the front of the case to protect the scales and tubes.

TH426 Japanned case .... each *b* **£0 18 0**

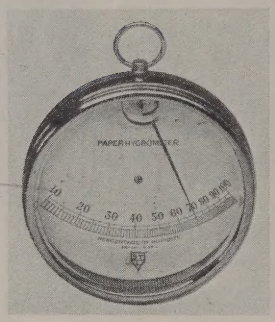
TH428 Copper case .... ,, *b* **£1 2 6**



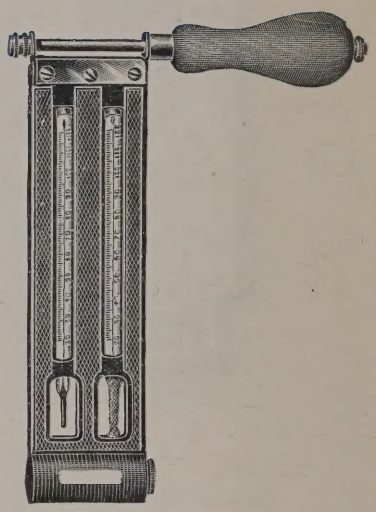
TH430 TH432



TH434



TH436-TH440



TH442

TH430 **Mason's Hygrometers,** narrow pattern, without the cage guard, cheap grade, boxwood scales in japanned case .... each *b* £0 10 6

TH432 **Mason's Hygrometers,** cheap pattern, for demonstration purposes, on stout polished boxwood scales, enamel-backed tubes .... each *b* £0 9 0

TH434 **Rendall's Rate-of-Drying Meter** .... *f* £1 13 0

This instrument was designed in connection with the control of moisture in a large paper works where it was realised that troubles concerned with the " maturing " of paper-curling, expansion, etc. were due almost entirely to the relative moisture contents of the air and the paper. Again, to the cotton, tobacco, sugar, timber and many other industries the question of moisture is all important. The instrument gives the " drying potential " of the air, which depends on three factors : (1) The actual amount of moisture in the air ; (2) the temperature ; (3) the amount of air movement. The effects of all three factors have been combined into one instrument. The reading of the mercury on the scale very closely approximates to a measurement of the rate at which water would evaporate (as measured in grammes per square metre per hour) from a water surface under the existing conditions of temperature, relative humidity and air movement.

PAPER HYGROMETERS.

These instruments are specially made for testing the humidity in factories and workshops and other places in which it is important that the humidity should be known and controlled.

Each one is tested against standard instruments throughout the whole range of the scale and is guaranteed to be accurate.

They are made in three sizes :

TH436 With 2 in. dials. Scale 10 to 100 per cent. .... *d* £0 10 6

TH438 ,, 3 ,, ,, ... *d* £0 15 0

TH440 ,, 5 ,, ,, ... *d* £1 1 0

TH441 **Hygrometer** as TH440, but with temperature scale 20° to 120° F. in addition .... *d* £1 15 0

TH442 **Whirling Hygrometer.** This pattern is recommended by the Hot and Deep Mines Temperature Committee, for whom we have made a number. Whirling a wet bulb and a dry bulb thermometer through the air has the same effect as placing the two thermometers in a strong current and the readings obtained are accurate and trustworthy. The thermometers have lens fronts and are divided on the stem and mounted in a composition frame as shown. Weight, in case, 13 oz. (370 grammes) ; usual range, 20° to 120° F. or −5° to 50° C. .... Price *d* £1 10 0

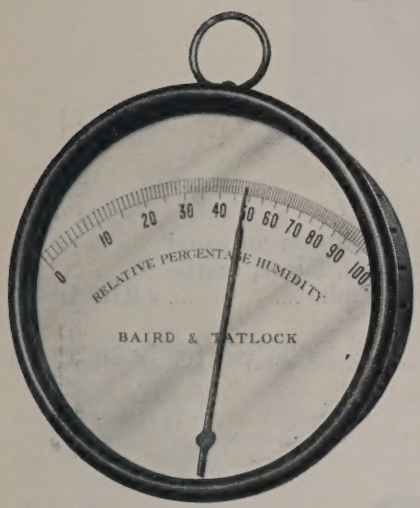
TH443 **Leather Sling Case** for above .... extra *d* £0 4 6

TH444 **Book of Tables** for Fahrenheit scales for above .... ,, *d* £0 1 6

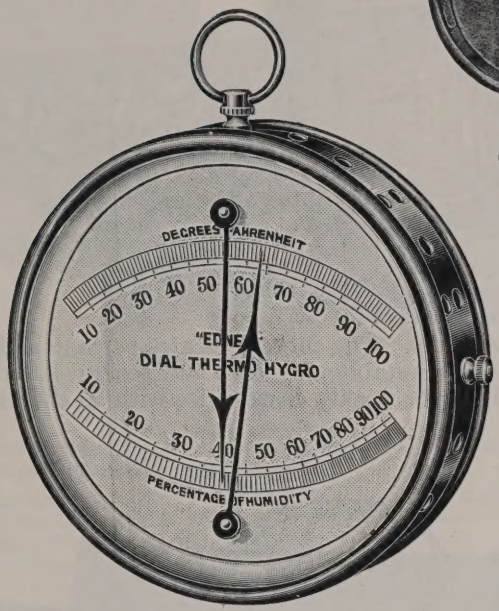
TH444a **Book of Tables** for Centigrade scales .... *f* £0 8 6

TH445 **Spare Thermometer** .... *d* £0 6 0

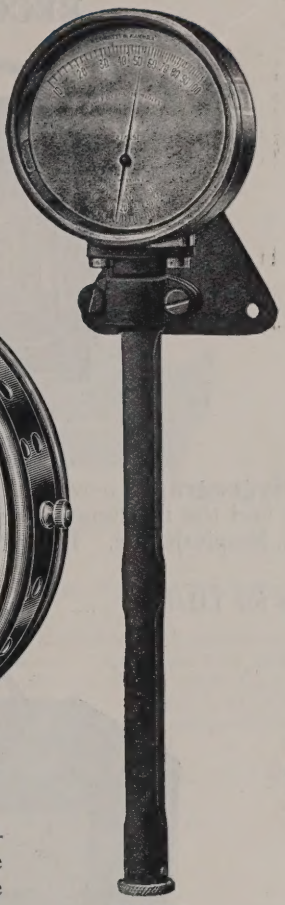
HAIR HYGROMETERS



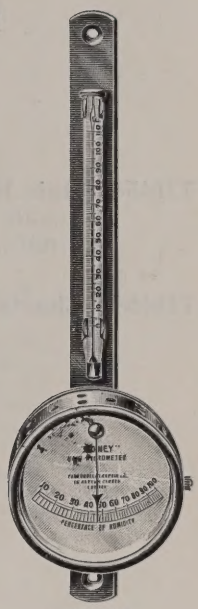
TH450



TH452



TH454



TH456

Hair Hygrometers—or **Hygroscopes** as they are termed—are widely used in factories, institutions, etc. where a simple direct reading instrument is required to show at a glance the relative humidity of the atmosphere.

TH450 **Pocket Hygrometer** (**Hygroscope**), an inexpensive, portable and convenient instrument. Hair principle; equally sensitive to No. TH454, but as the hair is not so well exposed there is a short time lag. Pointer indicates on the dial direct percentage of relative humidity. 4 in. dial, range 0 to 100 per cent., metal case, black finish; white dial with black divisions and figures .... *d* £1 5 0

TH452 **Hair Hygrometer,** to show directly the percentage of humidity 10 to 100 per cent. in the room or other place in which it is hung. Strongly made, mounted in stout polished and lacquered brass case, with 5 in. dial giving a very open range, and tested to give accurate readings .... each *d* £2 2 0

TH453 **Hair Hygrometer,** as TH452 but with Temperature Scale 10° to 100° F. in addition .... *d* £3 3 0

TH454 **Hair Hygrometer.** This instrument has many improvements in design and is a great advance on older patterns. The instrument takes the form of a 3½ in. diameter dial, beneath which is a slotted tube in which the hairs are mounted. At the lower end of the tube an adjustment screw is provided, to which the hairs are anchored. At the top end of the hairs a link piece is connected direct to a crank on the pointer spindle. Two scales are provided on the dial, one indicating relative percentage humidity and the smaller scale the dew point. There are no springs, gears or cords in the mechanism, and errors due to backlash, friction, etc. are thus reduced to a minimum. Overall length, 15 in. Enamel finish, with nickel-plated rim to dial .... *f* £3 10 0

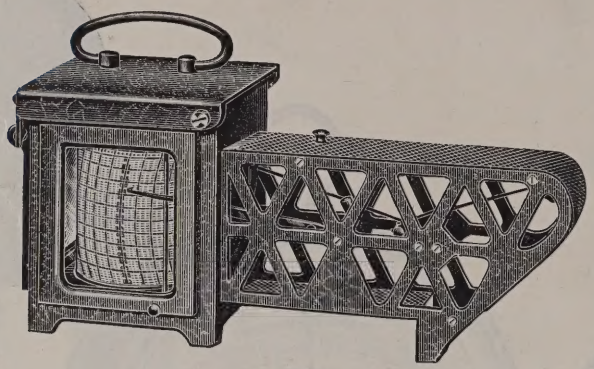
TH455 **Ditto,** with maximum and minimum electric contacts for small currents not exceeding 4 volts, 0·2 amps. .... *f* £4 17 6

TH456 **Polymeter,** to show directly the temperature and relative humidity of the atmosphere. Range 0 to 100 per cent. humidity and 0° to 110° F.

A. With 2 in. dial and 4 in. thermometer .... *d* £2 5 0

B. „ 5 „ „ 6 „ „ .... *d* £2 10 0

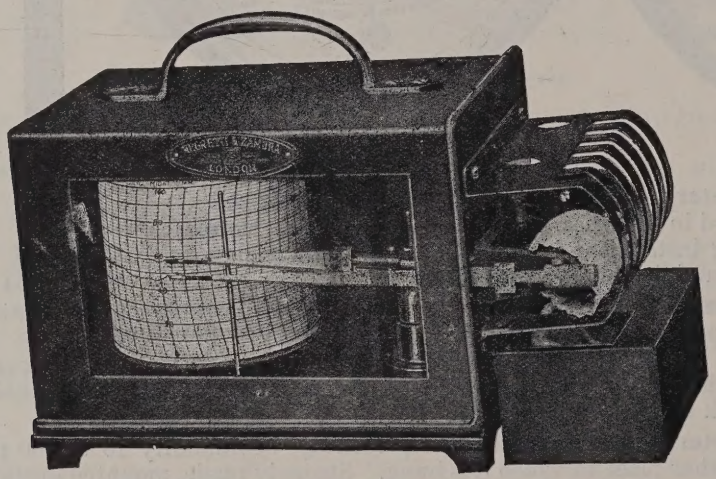
RECORDING HYGROMETERS.



TH458

TH458 **Hair Hygrograph,** new model. The curve indicates percentage humidity on an equal scale and the instrument is suitable for works and general laboratories, mines, textile mills, hospitals, etc. Daily or weekly clock, price with 55 charts and ink .... *d* **£10 10 0**

TH459 **Charts** for TH458 .... per 100 *d* **£0 15 0**



TH460

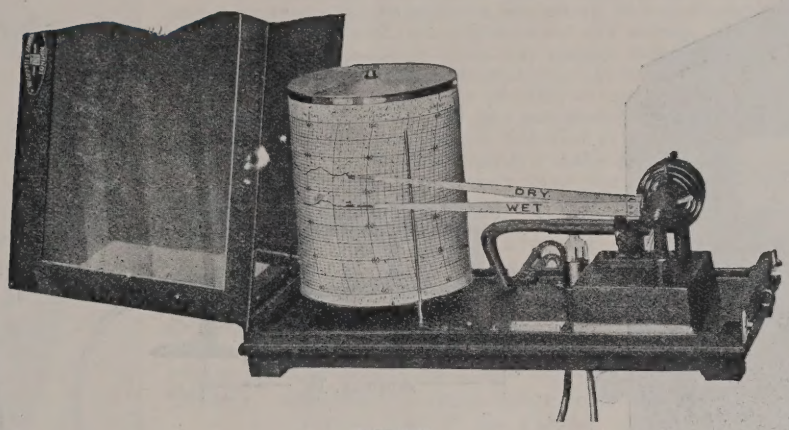
The Bimetallic Recording Hygrometer is similar in construction to the Recording Thermometer TH362 shown on page 654 except that a second pen arm and bimetallic coil is provided for the wet bulb readings. One pen traces the **air temperature** and the other the **wet bulb temperature.** The wet bulb bimetallic coil is surrounded with a muslin sleeve and a wick dipping into a tank filled with distilled water underneath the coil. This instrument records the dry bulb or air temperature with precision, but the record of the wet bulb readings can only be regarded as approximate, due to the fact that a film of moisture does not completely surround the bimetallic strip and to the dead region of air inside the coil. This instrument is of value in reproducing similar conditions of humidity during a process, but not for giving a true indication of humidity. Daily **or** weekly clock. Hinged glass-panelled metal cover to case. Standard ranges, 0° to 100° F., 30° to 130° F., 50° to 150° F., – 10° to 45° C., 0° to 55° C., 10° to 65° C.

TH460 **Bimetallic Wet and Dry Bulb Recording Hygrometer** to any of the above standard types, complete with 100 charts and ink .... *f* **£12 10 0**

TH461 **Charts** for TH460 .... per 100 *f* **£0 12 0**

RECORDING HYGROMETERS.

VERTICAL DRUM TYPES.

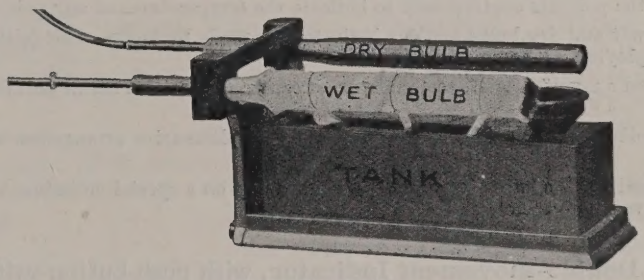


TH465

For the purpose of recording humidity at a distance, such as occurs with timber drying, etc., the **Mercury-in-Steel Wet and Dry Bulb Temperature Recorder** is very suitable.

The instrument is constructed on similar lines to the Double Pen Recording Thermometer, with the exception that the bulbs are specially sensitive and are coated with pure tin to prevent corrosion. One of the two bulbs is covered with a wick sleeve. A tank is provided immediately under the wet bulb, into which the wicks from the sleeve dip. The tank is mounted on a casting, to which the wet and dry bulbs are fixed. The tank is filled with distilled water from time to time, and beyond the occasional changing of the absorbent sleeve and winding the clock, no further attention is required.

A large number of these instruments have been supplied, and have given satisfactory service for many years.



TH465–TH467

TH465 **Recording Hygrometer** to any of the following standard ranges, complete with 10 feet of capillary to each bulb, six spare sleeves, 100 charts and ink. Chart, 3·6 in. × 11·8 in. Daily **or** weekly clock .... *f* **£32 0 0**

Fahrenheit: (A) 0° to 100° (B) 60° ,, 160° Centigrade: (C) −10° to 40° (D) +10° ,, 90°

TH467 **Recording Hygrometer,** as above, but with chart 5·8 in. × 16·2 in. Daily **or** weekly clock *f* **£37 0 0**

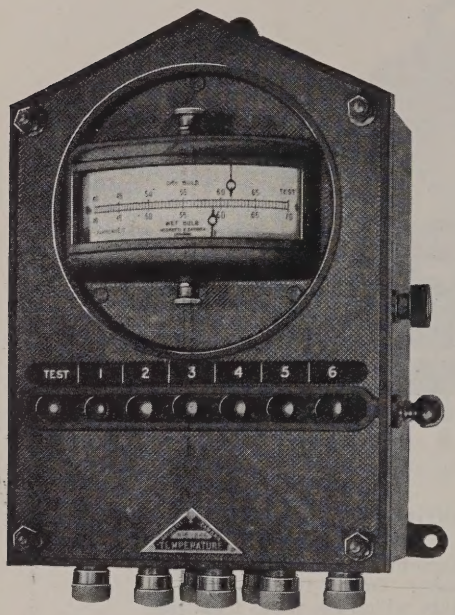
Fahrenheit: (A) 0° to 100° (B) 60° ,, 160° Centigrade: (C) −10° to 40° (D) +10° ,, 90°

Extra capillary to either bulb beyond 10 feet .... per ft. *f* **£0 4 0**

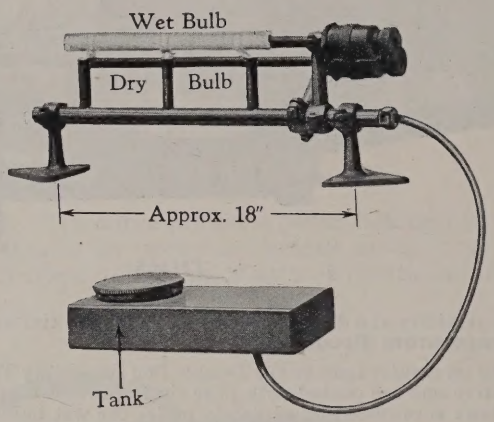
TH468 **Charts** .... per 100, TH465 *f* **12/-**; TH467 *f* **£0 15 0**

WET AND DRY BULB ELECTRICAL RESISTANCE THERMOMETER.

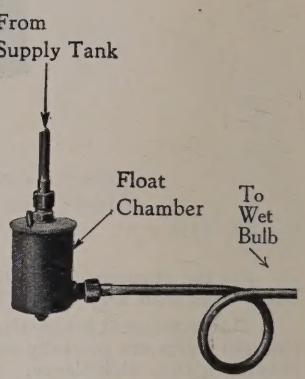
(HYGROMETER.)



TH473



TH476 Wet and Dry Bulbs and Tank



Float Chamber of **TH477**

The arrangement consists of two Wheatstone Bridge Type Electrical Thermometer Movements fitted in one indicator case. This enables the difference between the wet and dry bulb temperatures to be read at a glance, as both pointers indicate simultaneously on the same scale. The latter is of the edgewise type, and can be supplied for an open range covering 30° F. or a wider range if required. The instrument can be arranged for any number of pairs of wet and dry bulbs, and is fitted with one push-button switch for each pair. A locking device is provided which retains any switch in the " on " position, thus allowing the pointers continuously to indicate the temperatures of any pair of bulbs.

The connections between the wet and dry bulbs and the indicator are made by 3-core cable (either braided or lead covered) for each pair of bulbs employing a " common return."

The instrument is operated from a 2-volt 20 A.H. accumulator, or can be used with a mains unit for working off A.C. mains.

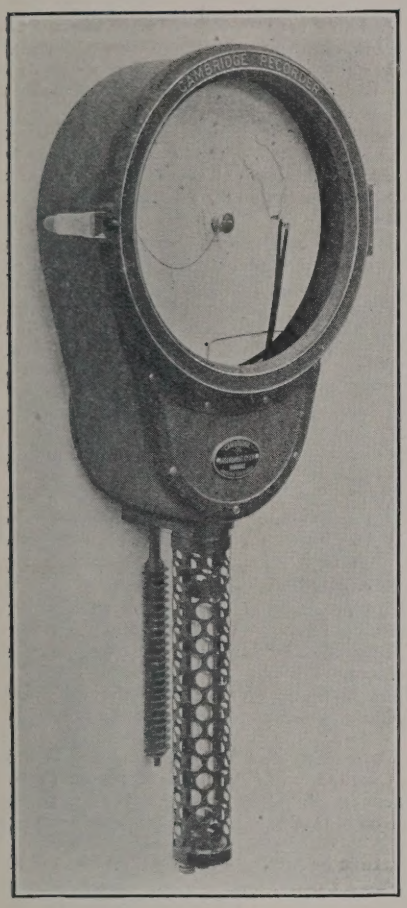
Various types of nickel coil bulbs and mountings can be supplied with alternative arrangements for feeding water to the wet bulb.

Where the bulbs are not exposed to circulating air, they can be arranged on a special mounting with an electric fan to create the necessary air flow to ventilate them properly.

TH470	**Totally-enclosed Double-movement Indicator,** with push-button switch gear; range as required. With two 2-volt 20 A.H. accumulators. For one pair of wet and dry bulbs			£	**28 2 6**
TH471	For two pairs of wet and dry bulbs	....		£	**31 2 6**
TH472	,, three ,, ,, ,,	....		£	**34 2 6**
TH473	,, six ,, ,, ,,	....		£	**43 2 6**
TH474	,, twelve ,, ,, ,,	....		£	**61 2 6**
TH475	**Bulbs, Wet and Dry,** with tank holding sufficient water for 7–10 days		per pair	£	**6 15 0**
TH476	**Ditto,** with separate water tank and 18 inches of copper connecting pipe	....	,,	£	**7 15 0**
TH477	**Ditto,** with float chamber for constant water level and complete with 10 feet of copper pipe		per pair	£	**8 5 0**

We shall be pleased to submit detailed estimates for complete installations upon receipt of full particulars.

COMBINED TEMPERATURE AND HUMIDITY RECORDERS.



TH480

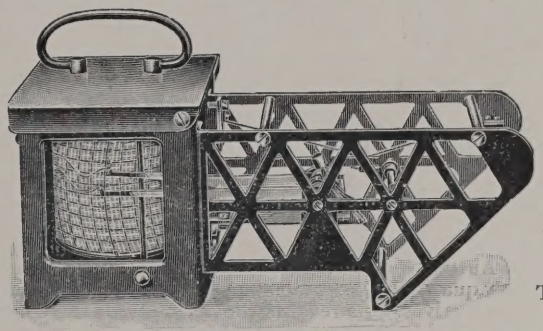
TH480 Combined Temperature and Humidity Recorder. With 100 standard charts, ink and fillers *f* **£22 10 0**

This instrument has been designed to provide simultaneous records of both temperature and humidity on one chart. It is particularly valuable for use in connection with the manufacture and storage of textiles, paper, tobacco and other products which may require definite atmospheric conditions for effective working or preservation. It may also be used as a reliable check on the ventilating systems of halls, lecture theatres, etc.

The recorder is fitted with two independent pens moving over a chart calibrated in temperature degrees and also in terms of relative humidity. The temperature recording mechanism is of the mercury-in-steel type, and has the sensitive bulb fitted immediately below the instrument case. This bulb is provided with radiator fins, which greatly increase the exposed area and render the instrument quickly responsive to small changes in temperature. In order to record the humidity, advantage is taken of the property of goldbeater's skin, which varies in length with the hygrometric state of the surrounding atmosphere.

The standard instrument has a humidity range of 30 to 100 per cent. saturation. The system is not suitable for conditions below 30 per cent. The temperature range, although usually supplied to cover atmospheric temperatures, can be made to suit almost any requirements.

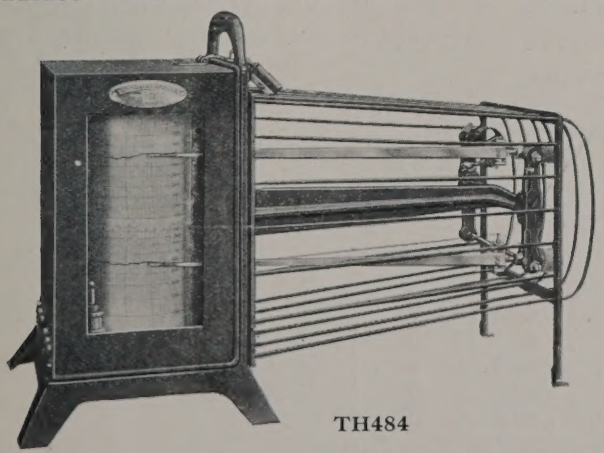
TH481 Charts, standard range 20 to 100 per cent. humidity, 20° to 100° F. for TH480 .... per 100 *f* **£0 7 6**



TH482

TH482 Combined Recording Thermo-hygrograph. This instrument is in daily use in tobacco factories, cotton and jute mills, etc., all over the world. The thermograph consists of a special patented bimetallic strip and the hygrograph is a bundle of hairs, which is the usual method. With two pens giving temperature and humidity, daily or weekly clock, range 0° to 100° F., 0 to 100 per cent. humidity, 55 charts and ink .... *d* **£13 10 0**

TH483 Charts for TH482 .... per 55, *d* **8/6**; per 100 *d* **£0 15 0**



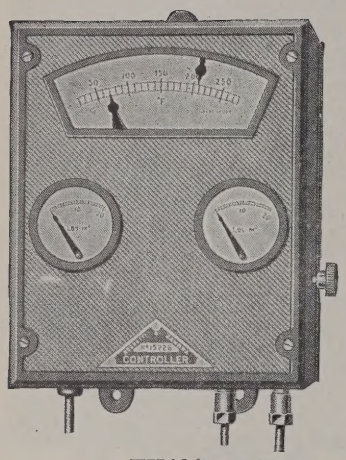
TH484

TH484 Improved Combined Temperature and Humidity Recorder, for the purpose of recording on one chart the changes in both temperature and humidity under atmospheric or artificially-controlled air conditions. The temperature scale is printed on the upper portion of the chart and the humidity scale on the lower portion. Total height of chart, 7 in.; clock revolving once in twenty-four hours **or** seven days. Standard range, 10° to 110° F. and 10 to 100 per cent. humidity. Complete with pens, ink and 100 charts .... *f* **£15 0 0**

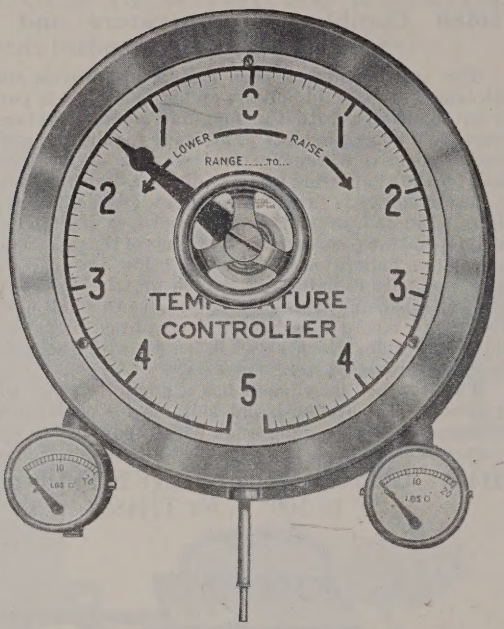
Tropical temperature range, 30° to 130° F., at same price.

TH485 Charts for TH484 .... per 100 *f* **£0 15 0**

AUTOMATIC TEMPERATURE REGULATOR.



TH486
Indicating Type Controller



TH487
Dial Type Controller

THE Automatic Temperature Regulator is suitable for controlling the temperature of tanks, pans, ovens, kilns, vulcanisers, chambers, etc., whether heated by steam, gas, or hot water, and it will maintain the temperature of processes within very close limits without attention.

Operating Medium.—Compressed air is employed to operate this Automatic Temperature Regulator. The reasons why compressed air was chosen are as follows :

- It has been proved to be thoroughly efficient and reliable in use in many spheres of engineering.
- It is easily and cheaply produced.
- It is easily cleaned and dried and is absolutely non-corrosive and non-wearing in regard to the parts of the control mechanism.
- It is easily disposed of when used by merely venting to atmosphere.
- It is practically unaffected by varying conditions of temperature.
- It is already available in most plants for various industrial purposes, and the cost of the small quantity used in the control system is practically negligible.

The pressure of air used in the control system is 15 lbs. to the square inch. Where a supply at higher pressures already exists, this may be easily tapped. A suitable reducing valve is supplied to maintain correct pressure.

Where no air supply is available, suitable small-sized compressors are supplied. These may be arranged for drive by any convenient means. For cleaning and drying the air supply, a combined water trap and filter is supplied. This is to clean the air immediately before it passes through any of the control systems.

Accuracy.—The Automatic Temperature Regulator can be adjusted to, and will work within, very fine limits. This is due to the special high quality of the patent mercury-in-steel thermometer movement, coupled with the special design of the balance leak and control valves. As regards the accuracy of the control, and the closeness it will keep the liquid or air to the selected temperature, this depends on a variety of factors and it is difficult to specify definitely, but it is usually possible to work within ±one-half of 1 per cent. of the total range of the instrument.

Range of Temperature.—The controller can be made to cover any range of temperature between −40° to 1200° F. (−40° to 650° C.). The standard ranges are as follows :

−40° to 160° F.	600° to 800° F.	−40° to 70° C.	320° to 430° C.
50° to 250° F.	800° to 1000° F.	0° to 110° C.	430° to 540° C.
200° to 400° F.	1000° to 1200° F.	100° to 210° C.	540° to 650° C.
400° to 600° F.		210° to 320° C.	

Capillary Tubing.—The capillary tubing consists of a fine steel bore tube enclosed in a copper tubing for protection. This can be further lead-covered for additional protection, if required. The length of the capillary tubing from the controller to the bulb may be any length up to 100 feet. The standard length is 20 feet.

Bulb Fitting.—The standard type of bulb fittings are shown on page 653. These, however, can be made to suit local conditions.

Control Valves.—These are made in a variety of patterns to suit requirements, and are made suitable for steam, gas, and water. **Prices upon application.**

QUESTIONNAIRE.

(1) Working temperature.
(2) Length of capillary tubing from bulb to controller.
(3) Type of bulb fitting.
(4) State the liquid, air, or gas to be controlled and whether of a corrosive nature.
(5) What is the heating medium—gas, steam, etc.
(6) If compressed air is available, state pressure.

With Bulb Fitting.	TH486. Price.	TH487. Price.	
TT/200	ƒ £36 0 0	ƒ £22 10 0	These Prices do not include Control Valve.
TT/202	ƒ £37 5 0	ƒ £23 15 0	
TT/203	ƒ £36 10 0	ƒ £23 0 0	
TT/206	ƒ £37 10 0	ƒ £24 0 0	
TT/210	ƒ £37 10 0	ƒ £24 0 0	

For Bulb Fittings see page 653.

We shall be pleased to send estimates for complete installations upon receipt of full details.

For electrically operated Temperature Controllers see Section V, Pyrometers.

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